

Falls on Sheep River near Rocky Mountain House, Alberta. Taken by L. C. Tilt, B.Sc.F., Forestry Branch.

DEPARTMENT OF THE INTERIOR
DOMINION OF CANADA

HON. W. J. ROCHE, *Minister*; W. W. CORY, *Deputy Minister*.

Irrigation Branch.

E. F. DRAKE, *Superintendent*.

REPORT

OF

Progress of Stream Measurements

(HYDROMETRIC SURVEYS)

FOR

THE CALENDAR YEAR 1914

PREPARED UNDER THE DIRECTION OF

F. H. PETERS, M. Can. Soc. C.E.,

COMMISSIONER OF IRRIGATION,

BY

P. M. SAUDER, M. Can. Soc. C.E., Chief Hydrometric Engineer,

Assisted by G. H. WHYTE and G. R. ELLIOTT, B.A.Sc., A.M. Can. Soc. C.E.

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OTTAWA

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EXCELLENT MAJESTY

1915

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To Field Marshal, His Royal Highness Prince Arthur William Patrick Albert, Duke of Connaught and of Strathearn, K.G., K.T., K.P., etc., etc., Governor General and Commander in Chief of the Dominion of Canada.

MAY IT PLEASE YOUR ROYAL HIGHNESS:

The undersigned has the honour to lay before Your Royal Highness the report of the Progress of Stream Measurements for the year 1914.

Respectfully submitted,

W. J. ROCHE,
Minister of the Interior.

OTTAWA, August 14, 1915.

DEPARTMENT OF THE INTERIOR,

OTTAWA, August 14, 1915.

The Honourable W. J. ROCHE, M.D.,
Minister of the Interior.

SIR:—

I have the honour to submit the report of Stream Measurements for the year 1914, and to recommend that it be published as the sixth of a series of progress reports.

I have the honour to be, Sir,
Your obedient servant,

W. W. CORY,
Deputy Minister of the Interior.

LETTERS OF TRANSMITTAL

5 GEORGE V.

SESSIONAL PAPER No. 25c

A. 1915

DEPARTMENT OF THE INTERIOR,

Irrigation Branch,

OTTAWA, August 14, 1915.

W. W. CORY, Esq., C.M.G.,

Deputy Minister of the Interior.

SIR:—

I submit herewith the report of Stream Measurements for the year 1914, submitted by F. H. Peters, C.E., Commissioner of Irrigation, and would recommend that it be published.

Respectfully submitted,

E. F. DRAKE,

Superintendent of Irrigation.

DEPARTMENT OF THE INTERIOR,

IRRIGATION OFFICE,

CALGARY, ALBERTA, July 30, 1915.

E. F. DRAKE, Esq.,

Superintendent of Irrigation,

Department of the Interior,

Ottawa, Canada.

SIR:—

I have the honour to transmit herewith the manuscript of the Report of the Progress of Stream Measurements for the calendar year 1914. This report has been prepared, under my direction, by P. M. Sauder, M. Can. Soc. C.E., Chief Hydrometric Engineer, G. H. Whyte, and G. R. Elliott, B. A. Sc.

I beg to recommend that it be published as the sixth of the series of Reports of Progress of Stream Measurements.

I have the honour to be, Sir,

Your obedient servant,

F. H. PETERS,

Commissioner of Irrigation.

DEPARTMENT OF THE INTERIOR,

IRRIGATION OFFICE,

CALGARY, ALBERTA, July 29, 1915.

F. H. PETERS, Esq., M. Can. Soc. C.E.,

Commissioner of Irrigation,

Department of the Interior,

Calgary, Alberta.

SIR:—

I beg to submit herewith the manuscript of the Report of Progress of Stream Measurements for the calendar year 1914.

Owing to the fact that much of my time has been taken by other duties, most of the work of preparing this report has fallen to my assistants, G. H. Whyte and G. R. Elliott, B.A. Sc. The report gives a brief outline of the methods of obtaining and compiling the data contained therein, but owing to the want of space and time, many of the details had to be omitted. There is given in tabulated form all the records of stream flow during 1914.

I beg to recommend that this report be published as the sixth of the series of Reports of Progress of Stream Measurements.

I have the honour to be, Sir,

Your obedient servant,

P. M. SAUDER,

Chief Hydrometric Engineer.

ERRATUM

The following table should be used instead of the monthly discharge summary on page 401.

MONTHLY DISCHARGE of Jones Creek at Stearns' Ranch, for 1914.

(Drainage area 5 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per Square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	18.20	2.10	6.930	1.380	1.54	412
May.....	2.30	0.88	1.77	0.354	0.41	109
June.....	2.50	0.34	1.12	0.224	0.25	67
July.....	0.51	0.00	0.126	0.025	0.03	8
August.....						<i>a</i>
September.....						<i>a</i>
October.....						<i>a</i>
The period.....					2.23	596

(a) Creek dry.

REPORT

OF

PROGRESS OF STREAM MEASUREMENTS FOR THE CALENDAR YEAR 1914.

By P. M. SAUDER, G. H. WHYTE, and G. R. ELLIOTT.

INTRODUCTION.

SCOPE OF WORK.

The chief features of the stream measurement work are the collection of data relating to the flow of surface waters and a study of the conditions affecting this flow. Information is also collected concerning river profiles, the duration and magnitude of floods, irrigation, water-power, storage, seepage, etc., which may be of use in hydrometric studies.

This information is obtained by a series of observations at regular gauging stations which are established at suitable points. The selection of sites for these gauging stations and their maintenance depend largely upon the physical features and needs of the locality. If water is to be used for irrigation purposes the summer flow receives special attention; where it is required for power purposes, it becomes necessary to determine the minimum flow; if water is to be stored, information is obtained regarding the maximum flow. In all cases the duration of the different stages of the streams is recorded. Throughout the country gauging stations are maintained for general statistical purposes, to show the conditions existing through long periods. They are also used as primary stations, and their records in connection with short series of measurements will serve as bases for estimating the flow at other points in the drainage basin.

During the open water season of 1914, records were taken at one hundred and seventy-four (174) regular gauging stations on various streams in Alberta and Saskatchewan, and at sixty-five (65) regular gauging stations on irrigation ditches and canals. Winter records, which are so valuable for power investigations and municipal water supplies, received special attention, and records were secured on almost all the important streams in the two provinces throughout the year.

ORGANIZATION.

The methods of carrying on the investigations were similar to those of previous years. Local residents were engaged to observe the gauge heights at regular stations. These observations were recorded in a book supplied by the department, and at the end of each week the observer copied the week's records on a postal card which was forwarded to the Calgary office by the first convenient mail.

District hydrometric engineers made regular visits to the gauging stations, usually once in every three weeks. On these visits they examined the observers' records, made discharge measurements, and collected such information and data as would be of use in making estimates of the daily flow at the station. The results of the discharge measurements and all data collected were forwarded as soon as possible after being completed to the Calgary office, where all reports are copied on regular forms and filed.

During the winter no records were taken at a number of the gauging stations, which made it possible to reduce the field staff and have each engineer spend some time in the office and assist in the final computations and estimates of run-off. As far as possible, the same engineer that did the field work made or checked the office computations, so as to eliminate any chance of error through lack of knowledge of the conditions at the gauging station.

Gauge height-area, gauge height-mean velocity, and gauge height-discharge curves were plotted and rating tables constructed. Tables of discharge measurements, daily gauge

height and discharge, and monthly discharge were also compiled. These records have been collected and are embodied in this, the Sixth Annual Report of Progress of Stream Measurements.

The organization during 1914 was also similar to the previous year, and the staff consisted of the chief hydrometric engineer, two assistant engineers, one recorder, one computer, and one clerk in the office, and thirteen assistant engineers in the field.

During 1914 the territory was divided for administrative purposes into eleven districts, viz., Banff, Calgary, Macleod, Cardston, Milk River, Western Cypress Hills, Eastern Cypress Hills, Wood Mountain, Saskatoon, Edmonton and Athabaska. In each district there was one engineer, who while in the field employed temporary assistance and was equipped with the necessary gauging and surveying instruments. In Banff, Calgary, Macleod, Saskatoon, Edmonton and Athabaska districts, the engineers travelled by train and hired livery, and stopped at hotels and stopping houses; while in the other districts they were supplied with a team, democat and camping outfit. One engineer was employed in an investigation of seepage and other losses in irrigation canals. The thirteenth engineer was employed at rating current meters, gauging the streams at Calgary, and other extra work. During the early spring, two of the irrigation inspecting engineers assisted in collecting records of the early spring run-off in the Cypress hills. An extra assistant engineer was employed during the winter of 1913-14 to make a special study of the winter flow of the North Saskatchewan River at Prince Albert, Saskatchewan.

BANFF DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established
Bath Creek.....	NE. 32-28-16-5	April 9, 1913
Bow River.....	SE. 28-28-16-5a	July 18, 1910
Bow River.....	SE. 35-25-12-5	May 25, 1909
Bow River.....	NW. 32-24-8-5	March 10, 1912
Cascade River.....	SE. 19-26-11-5	August 16, 1911
Forty-mile Creek.....	SW. 2-26-12-5	July 31, 1912
Ghost River.....	NE. 23-26-6-5	August 17, 1911
Jumpingpound Creek.....	SE. 30-24-4-5	May 7, 1908
Kananaskis River.....	SW. 34-24-8-5b	August 31, 1911
Louise Creek.....	NE. 20-28-16-5	July 5, 1913
Pipestone River.....	SW. 27-28-16-5	August 31, 1911
Spray River.....	NW. 25-25-12-5	July 15, 1910
Spray River.....	SE. 31-22-10-5	July 23, 1914
Spray Lakes overflow.....	SW. 32-22-10-5	July 24, 1914

Records have been obtained throughout the year on all the above stations excepting those on Bath Creek, Spray River (at Spray Lake), Spray Lake overflow and Jumpingpound Creek; observers were not available in the first three cases, and it was not desired to maintain the last station during the winter months.

Miscellaneous gaugings were made of Beaupré Creek (NE. 15-26-5-5), Big Hill Creek (SW. 10-26-4-5), Bow River (SW. 32-26-14-5), Grand Valley Creek (SW. 24-26-5-5), Healy Creek (SW. 29-25-12-5), Horse Creek (NE. 8-26-4-5), Spencer Creek (SE. 18-26-5-5), Vermillion Creek (SW. 32-26-14-5), Whiteman Creek (NW. 24-24-11-5), and tail-race of the Lake Louise power house.

By means of the storage facilities which the Calgary Power and Transmission Company now has, it can and usually does keep the flow of Bow River at their power plants uniform all winter and prevents the sudden very low flows that used to occur previously under natural conditions.

As much data as possible was collected on the flow of Spray River near the Spray Lakes, and it is expected that this information will be of value in connection with the proposed storage reservoirs at Spray Lakes.

H. C. Ritchie, A.M. Can. Soc. C.E., was in charge of the field work in this district, and the final computations were made by G. R. Elliott, A. Clement, and H. C. Ritchie.

CALGARY DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established
Bow River.....	SE. 2-21-19-4c	August 20, 1909
Bow River.....	NE. 32-21-25-4d	Sept. , 1909
Boxelder Creek.....	NE. 2-12-30-3	May 24, 1910
Bullshead Creek.....	SE. 16-12-5-4	July 26, 1909

a This station was originally located on NE. 28-28-16-5, but was moved to its present position on August 31, 1911.

b This station was originally located on NW. 33-24-8-5, but was moved to its present position on May 13, 1913.

c This station was originally located on Sec. 13-21-19-4, but was moved to its present position in May, 1913.

d This station was originally located on Sec. 31-21-25-4, but was moved to its present position in May, 1913.

Stream	Location	Date Established	
E. B. Canadian Pacific Railway Company Canal	SE. 3-21-18-4	June	6, 1914
N. B. Canadian Pacific Railway Company Canal	NW. 3-21-18-4	June	6, 1914
Elbow River	NW. 12-23-5-5	Sept.	29, 1914
Findlay & McDougal Ditch	SW. 31-18-29-4	June	17, 1911
Fish Creek	SW. 26-22-3-5	May	13, 1907
Highwood River	SE. 20-18-2-5	July	27, 1912
Highwood River	NW. 6-19-28-4	May	28, 1908
Highwood River	NW. 17-20-28-4	Oct.	3, 1911
Little Bow Ditch	SW. 6-19-28-4	Aug.	1, 1910
Mackay Creek	NW. 26-11-1-4	July	29, 1909
Pekisko Creek	NW. 8-17-2-5	Oct.	6, 1911
Ross Creek	NW. 31-11-2-4	July	28, 1909
Sevenpersons River	NE. 30-12-5-4	April	27, 1910
Sheep River	NW. 22-20-29-4	May	25, 1908
N.B. Sheep River	SW. 12-21-3-5	May	22, 1908
S.B. Sheep River	SW. 17-20-2-5	May	23, 1908
South Saskatchewan River	NW. 31-12-5-4	May	31, 1911
Stimson Creek	NW. 2-17-2-5a	Oct.	6, 1911

Miscellaneous gaugings were made of the North and South Branches of Fish Creek near Priddis, Lineham's spillway at High River, Pine Creek near De Winton, Tongueflag Creek near High River, and several springs.

It will be noted that this district did not include the Bow and Elbow Rivers at Calgary, and Nose Creek and Canadian Pacific Railway Company Canal near Calgary, but included instead several streams at and east of Medicine Hat, Alberta. Only a few records were obtained at the upper station on Bow River in this district. The new station on the Elbow River was established for the purpose of collecting better data on the possibilities of developing a water power and municipal water supply a few miles above that point.

The Calgary winter district included only Bow River near Bassano, Highwood River and Little Bow Ditch at High River, and Elbow River of the above list. The South Saskatchewan River at Medicine Hat was included in the Macleod district during the winter months.

J. S. Tempest, A.M. Can. Soc. C.E., H. S. Kerby, B.A.Sc., and R. J. McGuinness were in charge of this district for various periods, and H. S. Kerby made the final computations for the annual report.

MACLEOD DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established	
Belly River	NW. 1-9-22-4	August	31, 1911
Canyon Creek	NE. 14-6-2-5	July	6, 1910
Castle (Southfork) River	SW. 2-7-1-5	August	5, 1909
Cow Creek	NE. 14-8-2-5	May	26, 1910
Crowsnest River	SW. 12-8-5-5	July	28, 1910
Crowsnest River	NE. 36-7-4-5	July	28, 1910
Crowsnest River	NE. 26-7-2-5	Sept.	7, 1907
McGillivray Creek	SE. 7-8-4-5	July	23, 1913
Mill Creek	SW. 18-6-1-5	July	7, 1910
Mosquito Creek	NE. 30-16-28-4	August	1, 1908
Muddypound Creek	SW. 27-11-28-4	July	27, 1908
Nanton Creek	SE. 19-16-28-4b	August	3, 1908
Oldman River	NE. 34-7-1-5	Sept.	15, 1908
Oldman River	NW. 10-9-26-4	July	12, 1910
Pincher Creek	SW. 23-6-30-4	August	13, 1906
St. Mary River	NE. 26-7-22-4	Oct.	13, 1911
Todd Creek	SW. 19-8-1-5	August	3, 1909
Trout Creek	SE. 33-11-28-4	July	7, 1911
Willow Creek	SE. 26-9-26-4	July	1, 1909

Miscellaneous gaugings were made of Allison Creek (SW. 11-8-5-5), Bellevue Creek (NE. 29-7-3-5), Blairmore Creek (SE. 3-8-4-5), Connelly Creek (SE. 36-7-2-5), Dago Creek (NW. 17-13-2-5), Drum Creek (NW. 18-7-3-5), Ernst Creek (NW. 26-10-3-5), Fortier Springs (SE. 17-7-1-5), Gold Creek (SE. 30-7-3-5), Jim Creek (NE. 6-15-1-5), Lyon Creek (near Blairmore),

a This station was originally located on the SE. 14-17-2-5, but was moved to its present position on July 4th.

b This station was originally located on NW. 20-16-28-4, but was moved to its present location in Sept. 1913.

Nez-Perce Creek (SE. 17-8-4-5), Playle Creek (SW. 32-11-1-5), Summit Creek (SW. 12-8-6-5), York Creek (NW. 34-7-4-5), and several other spring creeks and springs.

As this district has been organized for several years and there have been no extensive developments of the water resources, no changes of any account were made during the past year. Records of the flow of Oldman River have, however, become very valuable in connection with the investigation of the proposed scheme to irrigate a large tract of land lying between Little Bow River and Oldman River.

Winter records were taken of Belly River, Castle River, Crowsnest River (three stations), Oldman River (two stations), St. Mary River and Summit Creek (miscellaneous); Belly and St. Mary Rivers being included in the Cardston district during the winter months.

E. W. W. Hughes and F. R. Burfield, A.M.I.C.E., were in charge of field work in this district for short periods until May, when J. E. Caghey, B.Sc., was placed in charge for the balance of the year. The final computations were made by J. E. Caghey, W. E. G. Hall, and O. H. Hoover.

CARDSTON DISTRICT.

This district included the following regular gauging stations :

Stream	Location	Date Established
Alberta Railway and Irrigation Company Canal...	SE. 21-2-24-4	July 26, 1910
Alberta Railway and Irrigation Company Canal...	NW. 28-4-23-4	May 1, 1914
Belly River.....	NE. 5-2-28-4	Nov. 1, 1911
Belly River.....	SE. 21-6-25-4	May 27, 1909
Boundary Creek.....	NW. 20-1-26-4	June 18, 1913
Christianson Ditch.....	SE. 12-3-28-4	Sept. 14, 1911
Crooked Creek.....	SW. 22-2-29-4	Sept. 15, 1909
Fidler Brothers Ditch.....	SE. 19-1-26-4	Sept. 13, 1911
Lee Creek.....	NW. 10-3-25-4	June 28, 1909
Lee Creek.....	SE. 27-2-26-4	May 5, 1913
Mami Creek.....	SE. 19-2-27-4	August 13, 1909
N. B. Milk River.....	NE. 11-1-23-4a	July 21, 1909
N. B. Milk River.....	NE. 18-2-20-4	July 17, 1909
S. B. Milk River.....	{ SW. 29-37 N. 9 W.P.M. Montana, U.S.A. }	April 23, 1913
Pinepound Creek.....	NE. 29-4-23-4	April 30, 1914
Pothole Creek.....	NE. 1-6-22-4	April 28, 1914
Pothole Creek.....	NW. 10-5-22-4	April 27, 1914
Rolph Creek.....	SE. 21-2-24-4	May 17, 1911
St. Mary River.....	NW. 25-1-25-4	By A.R.I. Co. in 1905
Waterton River.....	NE. 8-2-29-4	Aug. 26, 1908

As more satisfactory records can be obtained on Lee Creek, at the upper station, the lower station at Cardston was abandoned on July 13, 1914.

In 1912 an arrangement was made with the United States Geological Survey by which regular gauging stations on St. Mary and Milk Rivers would be maintained jointly, each bearing half the cost of construction and maintenance. The upper stations on St. Mary River and the North Branch of Milk River were therefore re-located at better sites, and a new station was established on the South Branch of Milk River in the state of Montana. These stations were equipped with automatic recording gauges early in 1913, which have been used since then.

Miscellaneous gaugings were made of North and South Branches of Belly River (Montana), Berta Creek (Waterton Lakes), Blakiston Brook (NE. 30-1-29-4), Cottonwood Creek (20-2-29-4), Drywood River (NW. 18-4-29-4), Hellroaring Creek (Waterton Lakes), Oil Creek (SW. 23-1-30-4), Pine Creek (NW. 21-3-29-4), and St. Mary River (SW. 23-3-25-4), J. N. West's Ditch and Yarrow Creek (14-4-29-4).

Winter records were taken of Belly River (two stations), Lee Creek, North Branch of Milk River, St. Mary River, and Waterton River.

J. E. Degnan was in charge of the field work in this district until March, and O. H. Hoover, B.A.Sc., for the balance of the year. The final computations for the annual report were made by O. H. Hoover and J. E. Degnan.

MILK RIVER DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established
Deer Creek Cattle Co. West Ditch.....	SW. 36-1-12-4	April 30, 1914
Deer Creek Cattle Co. East Ditch.....	SW. 36-1-12-4	April 27, 1912
Etzikom Coulee.....	SW. 3-7-19-4	April 16, 1914

a This station was originally located on NE. 13-1-23-4, but was moved to its present position on May 1, 1913.

SESSIONAL PAPER No. 25c

Stream	Location	Date Established
Hooper and Huckvale South Ditch.....	NE. 22-4-6-4	May 2, 1912
Hooper and Huckvale North Ditch.....	SW. 27-4-6-4	March 7, 1914
Manyberries Creek.....	SW. 27-4-6-1a	June 17, 1910
Milk River.....	NE. 21-2-16-4	May 18, 1909
Milk River.....	SW. 35-1-13-4	August 2, 1909
Milk River.....	SW. 21-2-8-4	August 5, 1909
Milk River.....	NE. 6-37 N-9 E.P.M. } Montana, U.S.A.b	August 7, 1909
N.B. Milk River.....	SW. 19-2-18-4	July 15, 1909
S.B. Milk River.....	NW. 31-1-18-4	July 14, 1909

It was impossible to secure an observer for the gauge on the North Branch of Milk River on the SW. $\frac{1}{4}$ Sec. 19, Tp. 2, Rge. 18, W. 4th Mer., but discharge measurements were made at every opportunity.

The gauging station in the State of Montana is maintained jointly with the United States Geological Survey. It was equipped with an automatic gauge early in the summer of 1913.

Miscellaneous gaugings were made of Beargulch Creek (Sec. 19-2-9-4), Canal Creek (Sec. 6-4-6-4), Deadhorse Coulee (Sec. 4-2-11-4), Deer Creek (NE. 26, S.W. 36, and SW. 15-1-12-4), Halfbreed Creek (Sec. 28-2-10-4), Irrigation Creek (SW. 36-5-7-4), Kennedy Creek (Sec. 3-1-5-4), Ketchum Creek (4-6-4), Mackie Creek (Sec. 19-2-18-4), Miners Coulee (Sec. 11-2-11-4), and Police Coulee (Sec. 35-1-13-4).

Winter records were taken only at the regular gauging station on Milk River on the NE. $\frac{1}{4}$ Sec. 21, Tp. 2, Rge. 16, W. 4th Mer., which was included in the Cardston district during the winter months.

J. E. Degnan was in charge of field work in this district and made the final computations for the annual report. During the early spring run-off, H. W. Rowley, B.Sc., made numerous gaugings on Manyberries Creek and the other streams in Pakowki Lake drainage basin.

WESTERN CYPRESS HILLS.

This district included the following regular gauging stations:

Stream	Location	Date Established
Adams North Ditch.....	NE. 10-9-27-3	May 22, 1914
Adams South Ditch.....	NE. 10-9-27-3	May 22, 1914
Anderson Ditch.....	SW. 23-6-3-4	Sept. 23, 1911
Battle Creek.....	NE. 33-5-29-3	June 3, 1909
Battle Creek.....	NW. 33-5-27-3c	July 5, 1910
Battle Creek.....	NE. 3-3-27-3	May 11, 1910
Bullshead Creek.....	NW. 15-9-5-4	Oct. 9, 1911
Cheeseman West Ditch.....	SW. 12-8-29-3	June 24, 1911
Cheeseman East Ditch.....	SW. 12-8-29-3	June 24, 1911
Gaff Ditch.....	SW. 25-5-29-3	July 11, 1911
Gap Creek.....	SE. 4-10-27-3	April 25, 1909
Gap Creek.....	NE. 31-11-26-3	May 3, 1910
Gilchrist Bros. Ditch.....	SW. 11-5-27-3	Oct. 16, 1911
Grosventre Creek.....	SE. 27-9-4-4	Oct. 10, 1911
Lindner Ditch.....	NW. 10-6-29-3	July 26, 1910
Lodge Creek.....	NW. 10-6-3-4	July 22, 1909
Lodge Creek.....	NE. 25-3-1-4d	August 31, 1912
Lodge Creek.....	SE. 12-1-29-3	August 13, 1909
E.B. Lodge Creek.....	SE. 1-7-3-4	Oct. 17, 1911
E.B. Mackay Creek.....	NW. 36-10-1-4	Oct. 13, 1911
W. B. Mackay Creek.....	NE. 27-10-1-4e	Oct. 12, 1911
Maple Creek.....	NE. 16-11-26-3	May 9, 1908
Maple Creek.....	SE. 28-11-26-3	May 4, 1910
Marshall & Gaff Ditch.....	NE. 33-5-29-3	July 11, 1911
McKinnon Ditch.....	NW. 20-4-26-3	Oct. 20, 1911
McShane Creek.....	SW. 3-10-27-3	April 23, 1909
Middle Creek.....	SW. 35-5-1-4	June 21, 1910
Middle Creek.....	SW. 30-5-29-3	July 20, 1909
Middle Creek.....	NE. 4-2-29-3	June 13, 1910
Oxarart Creek.....	NE. 20-6-27-3	June 15, 1909
Pollock East Ditch.....	SW. 17-9-27-3	May 19, 1914
Pollock West Ditch.....	SW. 17-9-27-3	May 19, 1914

a This station was originally located on SE. 3-5-6-4, but was moved to its present position on May 2, 1912.

b This station was originally located on SE. 3-1-5-4, but was moved to its present position in the spring of 1913.

c This station was originally located on the SW. 2-6-23-3, but was moved to its present position on May 29, 1912.

d This station was originally located on the SW. 23-10-2-4, but was moved to its present position on September 20, 1912.

e This station was originally located on the NE. 36-3-1-4, but was moved to its present position on April 29, 1914.

Stream	Location	Date Established
Richardson Ditch.....	SE. 2-5-27-3	Oct. 14, 1911
Ross Creek.....	SE. 32-9-3-4a	Oct. 11, 1911
Sage Creek.....	NE. 9-1-2-4	August 10, 1909
Sixmile Creek.....	SW. 6-7-28-3b	July 22, 1909
Spangler Ditch.....	SW. 6-7-28-3	July 10, 1911
Starks & Burton Ditch.....	SE. 17-11-5-4	Oct. 9, 1911
Stirling & Nash Ditch.....	SE. 22-3-27-3	July 11, 1911
Tennile Creek.....	SE. 4-6-29-3	July 21, 1909
White Ditch.....	SW. 1-9-27-3	June 15, 1911
Wilson Ditch.....	NE. 34-5-28-3	June 21, 1911
Wood & Anderson Ditch.....	NE. 21-7-29-3	June 20, 1914
Wood & Anderson East Ditch.....	SE. 22-7-29-3	June 20, 1914
Wood & Anderson West Ditch.....	NE. 22-7-29-3	June 20, 1914

At all these stations, with the exception of Sage Creek, some records were obtained, but on a number of the ditches not sufficient data was obtained to enable any computations of daily flow being made.

Miscellaneous gaugings were made of Adams Springs (NW. 32-5-1-4), Battle Creek (Sec. 28-5-28-3), Fourmile Coulee (NW. 14-8-29-3), Gap Creek (NE. 20-8-27-3), Link's Spring (NW. 32-5-1-4), Maple Creek (Sec. 8-10-26-3), and on several other creeks and springs.

No winter records were taken on any of the streams in this district during 1914.

A special effort was made to obtain full information of the spring run-off of this district during 1914, and the district was divided into three sections with an engineer in each. H. D. St. A. Smith (Grad. R.M.C.), was in charge of the Willow Creek section, H. R. Carscallen, B.A.Sc., in charge of the Tennile section, and R. J. Srigley in charge of the section north of the Cypress Hills, west of Maple Creek. From April to the end of the season H. W. Rowley, B.Sc., was in charge of the whole district, and during the fall also acted as Water-master on Battle Creek, where, due to the low discharge, several questions of water rights came up. Mr. Rowley also made the final computations for the annual report.

The year 1914 was one of the driest on record, and the whole of this district suffered from lack of moisture. Most of the streams dried up for the greater part of their courses, and there was generally a lack of water for domestic and irrigation purposes. Apparently the only solution to a serious problem is the construction of reservoirs to retain the spring run-off until later in the year, when it is of most value.

During 1914, steel was laid on the Weyburn-Lethbridge Branch of the Canadian Pacific Railway as far west as the interprovincial boundary, and when this line is in operation it will make the district more accessible, and probably make it advisable to re-adjust the Eastern and Western Cypress Hills districts.

EASTERN CYPRESS HILLS.

This district included the following regular gauging stations:

Stream	Location	Date Established
Axton Ditch.....	NE. 26-7-21-3	July 26, 1913
Barroby Ditch.....	NE. 33-6-23-3	August 12, 1913
Bear Creek.....	SE. 18-11-23-3	June 22, 1908
E.B. Bear Creek.....	SE. 21-10-23-3	August 18, 1909
W.B. Bear Creek.....	SW. 32-10-23-3	Sept. 16, 1909
Belanger Creek.....	SW. 30-6-25-3	March 31, 1912
Beveridge Ditch.....	NW. 18-10-24-3	June 27, 1914
Bolingbroke Ditch.....	NE. 7-7-22-3	August 11, 1913
Bone Creek.....	NW. 34-8-22-3	July 2, 1908
Braniff Ditch.....	SE. 30-11-23-3	June 22, 1911
Bridge Creek.....	SE. 33-10-22-3	April 8, 1911
Bridge Creek.....	NW. 12-11-22-3	July 29, 1909
Clark & Thompson Ditch.....	NE. 5-7-21-3	July 19, 1913
F. Cross Ditch.....	NW. 15-7-22-3	Sept. 9, 1911
A. M. Cross Ditch.....	SE. 5-8-22-3	August 14, 1913
Cumberland Ditch.....	SW. 17-11-24-3	June 27, 1914
Davis Creek.....	NE. 29-6-25-3	May 24, 1909
Dimmock Bros. Ditch.....	SE. 16-11-21-3	Sept. 2, 1914
Drury Ditch.....	NW. 19-6-25-3	Sept. 2, 1914
Fairwell Creek.....	NW. 30-6-24-3	June 10, 1909
Fauquier Ditch.....	NE. 30-10-25-3	June 8, 1914
Fearon Ditch.....	SW. 6-11-24-3	June 25, 1912
Frenchman River.....	NW. 16-6-24-3	July 10, 1912

a This station was originally located on the NW. 24-9-3-4, but was moved to its present position on May 15, 1914.

b This station was originally located on the NW. 29-7-28-3, but was moved to its present position on July 4, 1911.

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Stream	Location	Date Established
Frenchman River.....	NE. 23-6-23-3	July 9, 1912
Frenchman River.....	SE. 31-6-21-3a	July 31, 1908
N.B. Frenchman River.....	NE. 16-7-22-3	July 25, 1908
Hammond Ditch.....	SW. 16-10-25-3	June 13, 1912
Hawkin Ditch.....	SE. 26-9-20-3	July 9, 1913
Hay Creek.....	SW. 29-10-25-3	July 4, 1910
Hay Creek.....	NE. 30-10-25-3	April 22, 1909
Jones Creek.....	SE. 20-8-20-3	May 15, 1912
Kearney Bros. Ditch.....	SE. 19-8-23-3	Sept. 6, 1913
Longpine Creek.....	NW. 27-7-26-3	July 17, 1909
Mann Ditch.....	NW. 32-10-22-3	July 1, 1913
E. B. McCarthy, Bertram & Salt Ditch.....	NW. 29-11-23-3	June 15, 1914
W. B. McCarthy, Bertram & Salt Ditch.....	NW. 29-11-23-3	June 15, 1914
Moorhead Ditch.....	SE. 25-10-25-3	June 10, 1911
Morrison Bros. Ditch.....	SW. 26-6-21-3	August 22, 1911
Needham Bros. Ditch.....	SW. 30-11-23-3	June 22, 1911
Parker North Ditch.....	SW. 4-9-20-3	July 15, 1913
Parker South Ditch.....	SW. 4-9-20-3	July 15, 1913
Pollock East Ditch.....	NW. 22-7-21-3	August 10, 1911
Pollock West Ditch.....	NW. 22-7-21-3	August 10, 1911
Piapot Creek.....	NE. 18-11-24-3b	June 17, 1908
Rose Creek.....	NE. 26-7-22-3	May 1, 1911
Skull Creek.....	NE. 29-10-22-3	April 8, 1911
Skull Creek.....	NW. 10-11-22-3	June 29, 1908
Stearns Ditch.....	NW. 20-8-20-3	July 16, 1913
Stearns Ditch.....	SW. 20-8-20-3	July 16, 1913
Stearns Ditch.....	SW. 17-8-20-3	July 16, 1913
Strong & Day Ditch.....	NE. 25-6-22-3c	July 31, 1908
Sucker Creek.....	NW. 24-6-26-3	May 26, 1909
Swiftcurrent Creek.....	SW. 22-7-21-3	May 18, 1909
Swiftcurrent Creek.....	NE. 18-10-19-3	June 15, 1910
Swiftcurrent Creek.....	NW. 17-10-19-3	May 27, 1910

Miscellaneous gaugings were made on Blacktail Creek (30-6-23-3), Calf Creek (SE. 5-8-22-3), Concrete Coulee (11-7-23-3), Cypress Lake overflow, Doyle Coulee (17-7-23-3), Frenchman River (26-6-21-3), Petrified Coulee (30-6-23-3), Saunders Springs, near Maple Creek, and several other streams and springs.

Artificial controls were constructed in Frenchman River at SE. 31-6-21-3 and NE. 23-6-23-3, late in the fall, and should improve the results at these points. A number of permanent weirs were placed on the smaller streams of the district, and it is the intention to continue the use of these devices in the future, as very satisfactory results were obtained.

The Weyburn-Lethbridge Branch of the Canadian Pacific Railway has been completed through the southern part of the district, and will materially assist the development of this territory, and no doubt result in many changes in our work in this district in the future.

The only winter records obtained in this district during 1914 were on Saunders Springs, near Maple Creek.

The year 1914 was noted for its small precipitation throughout this district, and thus the streams were all very low during the year.

The early spring run-off was obtained by two engineers in this district, M. H. French covering the stations south of Cypress Hills and H. O. Brown those north of the hills. F. R. Steinberger was in charge of the whole district from April to August; E. W. W. Hughes took charge for the balance of the season and made the final computations for the annual report.

WOOD MOUNTAIN DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established
Bate Creek.....	NW. 6-6-16-3	April 16, 1914
Bigbreed Creek.....	SE. 15-2-11-3	March 30, 1914
Bowrey Ditch.....	{ From Rock Creek (Montana) }	April 30, 1914
Frenchman River.....	NW. 3-2-11-3	March 28, 1914

^a This station was originally located on the NE. 31-6-21-3, but was moved to its present location on August 21, 1914.

^b This station was originally located on the SW. 17-11-21-3, but was moved to its present location on May 13, 1909.

^c This station was originally located on Sec. 36-6-22-3, but was moved to its present location on April 17, 1911.

Stream	Location	Date Established	
Frenchman River.....	SE. 27-5-16-3	April	10, 1914
Horse Creek.....	Near Barnard (Montana)	May	1, 1914
Littlebreed Creek.....	NW. 11-2-11-3	March	31, 1914
McEachran Creek.....	Near Barnard (Montana)	May	1, 1914
Mule Creek.....	SW. 33-5-17-3	April	15, 1914
Snake Creek.....	Near Barnard (Montana)	April	30, 1914
Snake Creek.....	SW. 16-4-13-3	April	17, 1914

Miscellaneous gaugings were made of a few small spring creeks and coulees.

This district was established to obtain records of the flow of the Frenchman River and tributaries near the international boundary in connection with the investigations of boundary waters and proposed storage reservoirs. In order to get suitable sites, a few of the stations had to be established in the State of Montana. In connection with the establishment of these stations, cables were erected at three points, viz.: Frenchman River (two stations) and Snake Creek.

E. W. W. Hughes was in charge of the field work in this district, established the stations and made the final computations for the annual report. From August to November he also had charge of the field work in the Eastern Cypress Hills district, as well as the Wood Mountain district.

SASKATOON DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established	
Battle River.....	NW. 25-43-17-3	May	23, 1914
Battle River.....	SE. 19-43-16-3	June	17, 1911
Bridge Creek.....	SE. 23-13-19-3	March	29, 1911
Long Creek.....	SE. 10-2-8-2	June	22, 1911
Moose Mountain Creek.....	NE. 15-3-2-2	Sept.	4, 1913
Moosejaw Creek.....	NE. 24-11-19-2	June	21, 1911
Moosejaw Creek.....	NW. 16-16-26-2	April	7, 1910
Notukeu Creek.....	NW. 10-11-10-3	August	7, 1914
Qu'Appelle River.....	NW. 33-19-21-2	May	12, 1911
North Saskatchewan River.....	{ SW. 33 and NE. 29-43-16-3	{ May	{ 16, 1911
North Saskatchewan River.....	{ River Lot No. 76, Prince Albert Settlement	{ Oct.	{ 2, 1911
South Saskatchewan River.....	SE. 28-36-5-3	May	27, 1911
Souris River.....	NE. 11-2-8-2	June	23, 1911
Souris River.....	NE. 36-2-1-2	June	26, 1911
Souris River.....	SW. 6-4-26-1	July	20, 1911
Swiftcurrent Creek.....	SW. 12-15-14-3	April	30, 1910
Swiftcurrent Creek.....	NW. 18-15-13-3	May	5, 1913

The station on Notukeu Creek was established to determine the quantity of water available in that locality for domestic and municipal purposes. The ones on Swiftcurrent Creek are maintained for the same purpose, and to make it possible to get accurate records a concrete control and weir were constructed in this stream at the gauge on the SW. $\frac{1}{4}$ Sec. 12, Tp. 15, Rge. 14, W. 3rd Mer., late in the fall of 1914.

Miscellaneous gaugings were made of Souris River at Weyburn, Little Red River at Prince Albert, Springs near Gull Lake, and elsewhere.

Winter records were obtained at all the regular stations in this district, excepting the upper station on Battle River, Moose Mountain Creek, the upper station on Moosejaw Creek, and the two lower stations on Souris River. The stations west of Moosejaw were included in the Macleod district during the winter of 1914-15.

As intimated elsewhere, a special study was made of the flow of the North Saskatchewan River at Prince Albert during the winter of 1913-14, by W. H. Storey. The gauge was read and recorded three times each day and the discharge was measured three times each week. Besides providing the data required by the Water Power Branch, these records are very valuable on account of their great accuracy for testing the different methods of determining the discharge of an ice-covered stream. A special report on this work was written by Mr. G. H. Whyte, and is attached to this report as an appendix.

F. R. Steinberger, B.E., was in charge of the district except from April to September, when W. H. Storey was in charge. Mr. Storey also made the final computations for the annual report.

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EDMONTON DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established
Athabaska River.....	SE. 20-66-22-4	Feb. 23, 1913
Battle River.....	SW. 4-43-25-4	May 7, 1913
Clearwater River.....	SE. 16-39-7-5	June 3, 1913
Pigeon Creek.....	SE. 15-46-28-4	August 7, 1914
Red Deer River.....	SE. 20-38-27-4	Dec. 2, 1911
North Saskatchewan River.....	NW. 33-52-24-4	May 14, 1911
North Saskatchewan River...	NE. 21-39-7-5	June 2, 1913
Sturgeon River.....	NW. 28-55-22-4	Dec. 30, 1913
Sturgeon River.....	(Bet. River Lots 27 and 52 St. Albert Settlement)	Apr 1 23, 1913

Miscellaneous gaugings were made of Blindman River (NW. 15-39-27-4), Brazeau River (19-45-10-5), Buck Creek (SE. 23-47-6-5), Lesser Slave River (Mirror Landing), Nordegg River (SE. 24-45-10-5), and North Saskatchewan River (26-45-9-5 and NW. 2-49-7-5).

A cable and boat station was established on the Athabaska River at Athabaska so that continuous records could be obtained. Cable stations were also established on the North Saskatchewan and Clearwater Rivers at Rocky Mountain House.

All the stations in this district were maintained throughout the winter. Those on the Red Deer, North Saskatchewan and Clearwater Rivers were included in the Calgary district.

Miscellaneous gaugings of Buck Creek, Brazeau River, Nordegg River, North Saskatchewan River (near mouth of Brazeau River), and Pigeon Creek were also made in February and March by J. S. Tempest, who was in charge of the Calgary district at that time.

P. H. Daniells, B.Sc., was in charge of the Edmonton district, except from May to October, when J. M. Paul, B.A., B.E., was in charge. Mr. Paul made the final computations for the annual report.

ATHABASKA DISTRICT.

This district included the following regular gauging stations:

Stream	Location	Date Established
Athabaska River.....	NW. 15-45-1-6	March 4, 1913
Lobstick River.....	NE. 30-53-7-5	July 11, 1913
Maligne River.....	SW. 1-46-1-6	June 17, 1914
McLeod River.....	NW. 3-54-16-5	May 18, 1914
Miette River.....	SW. 9-45-1-6	August 23, 1913
Pembina River.....	SW. 20-53-7-5	Dec. 19, 1913
Rocky River.....	NW. 13-48-28-5	July 3, 1913
Sturgeon River.....	SW. 14-54-5-5	April 21, 1914
Sturgeon River.....	SE. 7-55-2-5	April 23, 1914
Sturgeon River.....	NW. 32-54-26-4	April 22, 1914

Miscellaneous gaugings were made of Athabaska River (NE. 5-51-25-5), Edson River (SE. 16-54-16-5), Embarras River (SW. 5-52-18-5), Fiddle Creek (near Miette Hot Springs), McLeod River (NW. 3-54-16-5), Maligne River (near Jasper), Prairie Creek (NE. 5-51-25-5), Snaring River (NW. 33-46-1-6), Sundance Creek (NW. 4-53-18-5), Stony River (near Hawes), North Saskatchewan River (NW. 2-49-7-5), and Wolf Creek (SW. 3-54-16-5).

Cable stations were constructed on the Pembina and Maligne Rivers during the year, and the ferry cable on the McLeod River used for gauging.

All the above regular and most of the miscellaneous gauging stations were maintained throughout the winter, and were included in the Edmonton district. Due to the fact that the country is not well settled, it is very hard to obtain observers at most points, and thus impossible to maintain regular gauging stations everywhere they are desired.

P. H. Daniells, B.Sc., was in charge of the field work during the year and also made the final computations for the annual report.

INVESTIGATION OF ABSORPTION LOSSES IN CANALS.

During 1914 the investigations which were commenced in 1913, to determine the absorption and seepage losses in canals, were continued by R. J. McGuinness, who spent the whole of the irrigation season on this work on the canals of the Western Section of the Canadian Pacific Railway Company's irrigation tract near Calgary, and the Alberta Railway and Irrigation Company's irrigation tract near Lethbridge. In this work we received the assistance of the officials of the above companies, and in all 256 measurements were made. The

DEPARTMENT OF THE INTERIOR

 STREAM MEASUREMENTS - 1914 - PLATE NO 2.
 GAUGE HEIGHT - DISCHARGE, GAUGE HEIGHT -
 MEAN VELOCITY AND GAUGE HEIGHT - AREA CURVES
 FOR

BOW RIVER

NEAR

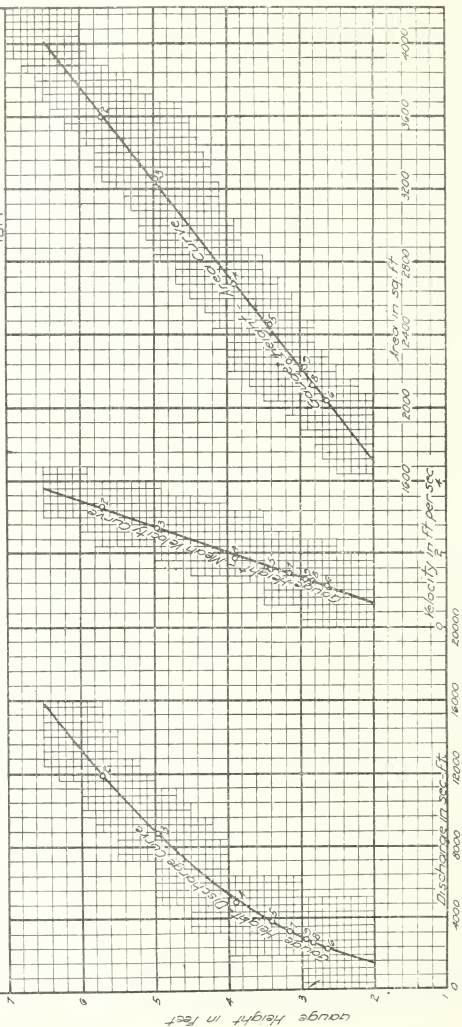
BASSAND - ALBERTA

SE. ¼ SEC 2, T. P. 21, R. 6, W. 4, OF 4TH MER.

FOR

1914

No	Date	Area	M.V.	G.H.	Dis
2	June 7	3359	3.29	5.71	11830
3	" 23	3249	2.69	4.56	8750
4	July 27	2676	1.84	3.20	4902
5	Aug 25	2458	1.57	3.41	3851
6	Sept 15	2035	1.10	2.64	2244
7	Oct 10	2252	1.45	3.16	3278
8	" 28	2119	1.23	2.84	2601
9	Nov 27	2220	1.26	2.94	2802



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records obtained are given later in the report, and in addition to the work of measuring the flow of the canals the temperatures of the waters were also obtained. This work is being continued and should produce some valuable data in a year or two.

CURRENT-METER RATING STATION.

The rating station was kept in operation from early in April until the end of November. During this period all the current-meters used in the field were rated at least once, and most of them twice, while a few used on special work were rated three times.

During the season seventy-five current-meters were rated, forty-one for this branch, eleven for the British Columbia Hydrographic Survey, five for the British Columbia Government, twelve for the Manitoba Hydrographic Survey, four for the Department of Public Works of Canada, and two for the Canadian Pacific Railway Company. Each meter was rated in the condition it was received and, with few exceptions, again after being cleaned, adjusted and fitted with a new bearing. Rating tables were prepared for each rating of a meter and blue-prints made, which are sent out with the instrument, while the originals are filed for reference in the office.

In addition to the regular work a few experiments on rating meters were carried out. These gave results which will be of assistance in future rating and field work. It is the intention, however, to make further and more extensive investigations before publishing the results.

R. J. Srigley was in charge of the work. He was assisted by Captain Clifford, D.S.O., until he left with the first Canadian Overseas Expeditionary Force in August. For the balance of the season Mr. Srigley rated the current meters without help.

BENCH-MARKS.

When the stream measurement work was first started, the gauges were usually referred to bench-marks on wooden stakes or stumps of trees. These were easily shifted or destroyed, and were not satisfactory. In 1911 an iron bench-mark was adopted by this branch, and now almost all the gauges are either referred to bench-marks on concrete piers or other permanent structures, or to one of these iron bench-marks. Whenever an opportunity is afforded, these are tied to the Canadian Pacific Railway or Dominion Government levels, to determine their elevation above sea level, and they are therefore also a convenient reference for local levelling operations.

Descriptions of the iron bench-marks are given in the Report of the Progress of Stream Measurements for 1911 and 1912.

OFFICE WORK.

As above intimated, the reports of the gauge height observers and the hydrometric engineers are transmitted to the office by mail. These are copied on office forms and filed in a cabinet, which is carefully indexed, and where they can be referred to at any time without trouble. As the engineers complete their computations, the results are entered on convenient forms and filed in the same cabinet.

A cabinet made up of four styles of drawers is used for filing the records. The top section is used for filing the gauge height books of the observers and the current meter notes of the engineers. The gauge height books and current meter notes are filed alphabetically, according to the names of the streams. The next section contains the postal cards sent in by the observers, and these are also filed alphabetically according to the names of the streams. The third section is made up of map drawers, and contains the gauge height-area, gauge height-mean velocity and gauge height-discharge curves, and plotted cross-sections which are filed alphabetically, according to the names of the streams. The same section contains the maps showing the outlines of the drainage basins, filed numerically according to the number of the sectional sheet. The rating curves for the current meters are also filed in this section numerically, according to the office numbers of the meters. The bottom section of the cabinet consists of letter-size pockets, alphabetically arranged for each gauging station. The tables of gauge heights, discharge measurements, daily gauge height and discharge, monthly discharge, a description of the station, and memos of any changes are filed in these pockets. The different rating tables for each meter are also filed numerically in this section, and another drawer contains the daily and monthly reports of the meteorological service.

The copying and filing of the reports of the gauge height observers and the engineers is entrusted to the office recorder. While doing this he carefully examines all records to see that there are no errors, and where there are doubtful or impossible records it is his duty to have the data corrected or ascertain the cause of the unusual condition. He also makes out the pay list for the observers and conducts the correspondence relating to the records.

All computations are checked before being used or published. For this reason, as far as possible, men with some technical education, or students in science, are engaged as helpers. The gaugings are computed by the helper and his work is checked by the engineer. In some instances, where there is a great deal of driving and camping out, the engineer cannot secure a helper who can compute discharges, and in that case he computes the discharges himself, and his computations are checked in the office.

Gaugings of the flow under ice are usually made by using the multiple point method, and vertical velocity curves have to be plotted to determine the mean velocity in the vertical.

The computation by this method is long and tedious and cannot be done by the engineer in the field. There are therefore a great many computations to be made in the office, and the services of a computer are required.

During the year 1914, G. H. Nettleton filled the position of office recorder, and J. B. Gray that of office computer.

The results of the discharge measurements are plotted on cross-section paper by one of the assistant engineers as soon as they are received in the office, and thus a very close check is kept on the records, and errors can be detected at once and in most cases can be rectified. At the same time the records are kept up to date, and demands for provisional estimates can be met at an early date. Important changes in the flow are also detected at once, and instructions are issued without delay to the field men to obtain further gaugings. The first and second assistants to the chief engineer supervise the office and field work by constantly checking and inspecting it, and also do considerable work in the preparation of the annual and special reports.

P. M. Sauder, M. Can. Soc. C.E., occupies the position of chief hydrometric engineer, and G. H. Whyte and G. R. Elliott, B.A.Sc., A.M. Can. Soc. C.E., are respectively the first and second assistants.

CONVENTIONS AND CONFERENCES.

In January, G. H. Whyte attended a conference of the Western District Engineers of the Water Resources Branch of the United States Geological Survey, held at Boise, Idaho. As particulars of this conference were given in the report for 1913, no further space will be given to it here.

On February 20th and 21st, the second annual conference of the hydrometric engineers of this office was held at Calgary, with all but two members of the staff present. A good deal of interest was taken in this, and a number of valuable suggestions made and papers given. It is hoped that we will be able to hold such conferences each year in future, as they enable the men to discuss the different features of the work and to obtain a better idea of the way the office and field work is carried on.

In October, P. M. Sauder and G. R. Elliott attended the International Irrigation Congress held at Calgary. This congress was very successful, but as complete printed reports of it will soon be available no further space will be given to it here.

It is unfortunate that it was not possible to send a representative to the conference of the District Engineers of the Water Resources Branch of the United States Geological Survey, held at Washington, D.C., in December, as this conference is always a great success. Copies of the papers read at this conference have, however, been received, and are very valuable and interesting.

FUTURE WORK.

During 1915, a special effort is being made to again obtain the total spring run-off of the main streams in the Cypress Hills and of Milk River drainage basin. The records obtained in 1914 on these streams are of especial value, and no doubt those of 1915 will be just as valuable, and it may not be found necessary to do early spring work in 1916, although it would be advisable.

The special work in the Wood Mountain district is to be continued during 1915, and will be of value in connection with the International Waterways' Treaty.

The investigations of absorption losses in irrigation canals will be continued during 1915, and will be extended to include other problems in connection with irrigation work.

Parties will be placed on the headwaters of the North Saskatchewan River and in the Peace River district, where scarcely any data regarding the run-off has been collected. In both these districts there are water power sites and records of the flow are required to determine the possibilities. Ordinary transportation facilities are not available in either district. The engineer on the headwaters of the North Saskatchewan River will therefore have to use pack ponies, and the one in Peace River district will probably use boats or canoes.

DEFINITIONS.

The volume of water flowing in a stream is known as run-off or discharge. In expressing it various units are used, depending upon the kind of work for which the data is needed. Those used in this report are "second-feet," "acre-feet," "run-off per square mile" and "run-off in depth in inches" and may be defined as follows:

"Second-foot" is an abbreviation for cubic foot per second, and is the body of water flowing in a stream one foot wide and one foot deep at the rate of one foot per second.

The "acre-foot" is the unit capacity used in connection with storage for irrigation work and is equivalent to 43,560 cubic feet. It is the quantity required to cover an acre to a depth of one foot.

The expression "second-feet per square mile" means the average number of cubic feet of water flowing each second from every square mile of drainage area on the assumption that the run-off is uniformly distributed.

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"Depth in inches" means the depth of water in inches that would have covered the drainage area, uniformly distributed, if all the water could have accumulated on the surface. This quantity is used for comparing run-off with rainfall, which quantity is usually given in depth in inches.

It should be noticed that "acre-feet" and "depth in inches" represent the actual quantities of water which are produced during the periods in question, while "second-feet," on the contrary, is merely a rate of flow per second.

EXPLANATION AND USE OF TABLES.

The data obtained and the estimates made therefrom have been compiled in tabulated form, and for each regular gauging station are given, as far as available, the following data:—

1. Description of station.
2. List of discharge measurements.
3. Table of daily gauge heights and discharges.
4. Table of monthly discharges and run-off.

The description of stations gives such general information about the locality and equipment as would enable the reader to find and use the station. It also gives, as far as possible, complete history of all the changes that have occurred since the station was established and that might affect the records in any way.

The list of discharge measurements gives the results of all the discharge measurements that have been made at or in the vicinity of the gauging station or have been used in completing the records for the gauging station. It gives the date on which the measurement was made, the name of the engineer, the width and area of cross-section, the mean velocity of the current, the gauge height and the discharge in second-feet.

The table of daily gauge heights and discharges given in this report is a combination of two tables kept in the office of the survey, namely, the table of daily gauge heights and the station rating table. The table of daily gauge heights gives the daily fluctuations of the surface of the water above the zero of the gauge, as reported by the observer. During high water, two observations of the gauge were made at some stations, and the gauge height given in the table is the mean of the observation for the day. Where automatic gauges are maintained the records given are the mean stage for the day. The discharge measurements and gauge heights are the base data from which the other tables are computed. The table of daily discharges is the discharge in second-feet, corresponding to the stage of the stream, as given by the station rating table.

In the table of monthly discharge the column headed "maximum" gives the mean flow for the day when the mean gauge height was highest. As the gauge height is the mean for the day, there might have been short periods when the water level and the corresponding discharge were higher than given in this column. Likewise, in the column "minimum," the quantity given is the mean flow for the day when the mean gauge height was lowest. The column headed "mean" is the average flow for each second during the month. The computations for the quantities in the remaining columns have been based upon this mean. The drainage area for each gauging station was marked off on the sectional maps of the department and the area taken off with a planimeter. In many districts, information regarding topographical features is very incomplete, and the computed areas are only approximate. As the surveys of the department are extended and completed, these computations will be checked and, if necessary, corrected.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:—

- 1 cubic foot equals 6.23 British Imperial gallons.
- 1 cubic foot equals 7.48 United States gallons.
- 1 acre equals 43,560 square feet; equals 4,840 square yards.
- 1 acre-foot equals 43,560 cubic feet.
- 1 acre-foot equals 271,472 British Imperial gallons.
- 1 acre-foot equals 325,850 United States gallons.
- 1 inch deep on 1 square mile equals 2,323,200 cubic feet.
- 1 inch deep on 1 square mile equals 0.0737 second-feet per year.
- 1 second-foot equals 6.23 British Imperial gallons per second; equals 373.8 gallons per minute; equals 538,272 gallons for one day.
- 1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,272 gallons for one day.
- 1 second-foot equals about 1 acre-inch per hour.
- 1 second-foot for one day equals 1.983 acre-feet.
- 1 second-foot for one 28-day month equals 55.54 acre-feet.
- 1 second-foot for one 29-day month equals 57.52 acre-feet.
- 1 second-foot for one 30-day month equals 59.50 acre-feet.
- 1 second-foot for one 31-day month equals 61.49 acre-feet.
- 1 second-foot for 153 days equals 303.47 acre-feet.
- 1 second-foot for one year equals 724 acre-feet.

DEPARTMENT OF THE INTERIOR

STREAM MEASUREMENTS - 1914 - PLATE NO 3.

DIAGRAM SHOWING THE EFFECT OF AN ICE COVER ON THE
RELATION BETWEEN THE GAUGE HEIGHTS AND DISCHARGES

ST. MARY RIVER

AT

WHITNEY'S RANCHE

NE 1/4 SEC 26, T. 7, R. 6 E. 22 W. D. F. 4 THMER

FOR
1914

Gauge Height in Feet

Discharge in second feet.

THE RIVER CLEARED OF ICE ABOUT THE MIDDLE OF
MARCH AND BECAME FROZEN OVER AGAIN ABOUT
THE END OF NOVEMBER. THE GAUGE HEIGHT DISCHARGE
CURVE IS BASED ON THE GAUGINGS MADE DURING THE
OPEN WATER PERIOD IN 1914 AND IS WELL DEFINED.
THE PLOTTED MEASUREMENTS ALSO SHOW HOW
IMPOSSIBLE IT IS TO DRAW A RATING CURVE WHEN ICE
CONDITIONS PREVAIL.

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Apr 30 1914

May 7 1914

May 14 1914

May 21 1914

May 28 1914

Jun 4 1914

Jun 11 1914

Jun 18 1914

Jun 25 1914

Jul 2 1914

Jul 9 1914

Jul 16 1914

Jul 23 1914

Jul 30 1914

Aug 6 1914

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Sep 3 1914

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- 1 second-foot for one 28-day month covers 1 square mile 1.041 inches deep.
- 1 second-foot for one 29-day month covers 1 square mile 1.079 inches deep.
- 1 second-foot for one 30-day month covers 1 square mile 1.116 inches deep.
- 1 second-foot for one 31-day month covers 1 square mile 1.153 inches deep.
- 1 second-foot for 153 days covers 150 acres 24.278 inches or 2.023 feet deep.
- 1 second-foot for one year covers 1 square mile 13.572 inches or 1.131 feet deep.
- 100 British Imperial gallons per minute equals 0.268 second-foot.
- 100 United States gallons per minute equals 0.223 second-foot.
- 1,000,000 British Imperial gallons per day equals 1.86 second-foot.
- 1,000,000 United States gallons per day equals 1.55 second-foot.
- 1,000,000 British Imperial gallons equals 3.68 acre-feet.
- 1,000,000 United States gallons equals 3.07 acre-feet.
- 1,000,000 cubic feet equals 22.95 acre-feet.
- 1 foot per second equals 0.682 miles per hour.
- 1 cubic foot of water weighs 62.5 pounds.
- 1 horse-power equals 550 foot-pounds per second.
- 1 horse-power equals 746 watts.
- 1 horse-power equals 1 second-foot falling 8.80 feet.
- 1½ horse power equals 1 kilowatt.
- 1 British Columbia miner's inch equals 1.68 cubic feet per minute, or 1 second-foot approximately equals 35.7 British Columbia miner's inches.

To calculate water power quickly: $\frac{\text{sec. ft. x fall in feet}}{11} = \frac{\text{net horsepower on water wheel, realizing 80 per cent of the theoretical power.}}$

To find the number of acre-feet required for a certain acreage under the prescribed duty of water of one hundred and fifty acres for each cubic foot of water per second flowing continuously during the irrigation season (153 days), multiply the acreage by 2.02314.

METHODS OF MEASURING STREAM FLOW.

There are three distinct methods of determining the surface flow of streams: (1) by measurements of slope and cross-section and the use of Chezy's and Kutter's formulae; (2) by means of weirs, which include any device or structure that by measuring the depth on a crest or sill of known length and form, the flow of water may be determined; (3) by measuring the velocity of the current and the cross-section. The third method is the one most commonly used by this survey. The second is used when the flow is too small to be accurately determined by the third, while the first is only used in making estimates of the discharge of a stream when the only data available are the cross-section and slope.

SLOPE METHOD OF DETERMINING DISCHARGE.—The slope of a stream, or rather of a section of a stream, is the difference in elevation between the upper and lower ends of the section, commonly called the fall, divided by the distance or the length of the section. Slope sections vary in length from a few hundred feet to several thousand feet, depending largely upon the nature of the stream.

It is difficult to ascertain accurately the slope of the water surface in a stream, since in nearly all streams there are pulsations in the water, causing the surface to rise and fall locally. In most streams the slope of the bottom is far from uniform, and the flow of water in any given section is more or less influenced by the flow in the adjacent section, above or below. For this reason it is a good plan to consider a number of adjacent sections, comprising a considerable length of the stream in one computation, being careful to take into account the diversity of cross-section at various places in the length, and the fact that the slope of the water surface of a stream becomes more uniform during high water and flood stages.

In determining the slope of the surface of a stream, levels are taken of the water surface at each end of the slope section, and referred to some datum or bench-mark. A good plan is to set firmly a stout wooden stake below the water surface at each end of the slope section, and then to drive a nail into the top of each stake, so that the nail-head will exactly coincide with the water surface. The difference in elevation between the two nail-heads, divided by the distance between the stakes, will give the slope.

The wetted perimeter is that portion of a stream channel that is in contact with the water. The form or outline of the wetted perimeter of a stream has an important influence upon the velocity of the current. It is usually determined graphically from the plotted cross-section or may be measured by means of a flexible tape or chain after the flood has subsided.

The hydraulic radius, which is sometimes called the mean radius of the channel below the water surface is found by dividing the area of the cross-section (in sq. ft.) by the length of the wetted perimeter (in feet).

The Chezy formula, which is the fundamental formula for stream discharge, is:

$$Q = A V$$

in which

Q = the discharge of the stream in sec.-ft.

A = the area of the cross-section in sq. feet.

V = the mean velocity of flow, in ft. per sec.

In applying this formula to the determination of stream discharge, the mean velocity of a

stream is considered a function of the slope and of the wetted perimeter of the stream. This may be expressed by formula as follows:

$V = C \sqrt{rs}$

in which r = the hydraulic radius of the channel.
 s = the surface slope.

and C is a variable coefficient, depending upon the nature of the channel.

In determining the value of C for any given case it is customary to make use of Kutter's formula, which is:

$$C = \frac{41.6 + \frac{.00281}{s} + \frac{1.811}{n}}{1 + \left\{ 41.6 + \frac{.00281}{s} \right\} \sqrt{\frac{n}{r}}}$$

In this formula r and s have the same significance as in the Chezy formula and the new factor n is called the coefficient of roughness. It is a variable coefficient, and its value is dependent upon the size, shape, slope and degree of roughness of the channel. Tables of values of n are given in various text books, but it is difficult to choose the correct value. It is therefore advisable, whenever possible, to compute the value of n from a measured discharge. As the slope method of determining discharge is seldom employed except to estimate flood discharge, a current meter measurement is very often made at the slope section, during low water. Having determined the mean velocity, slope and hydraulic radius at the time of the metering,

the value of C may be found from the formula $V = C \sqrt{rs}$ or $C = \frac{V}{\sqrt{rs}}$. Trautwine's Pocket Book for Civil Engineers and other texts contain tables giving the value of n for different values of r , s , and c . From these tables we can interpolate the proper value of n for a particular section of the stream, at low water stage. In most cases this value of n is applicable to high water and flood conditions of the stream also, and is used with values of r and s for the high water or flood cross-section to determine the value of C at the higher stage. Having determined the value of C the computation of the discharge is simple.

The results obtained by the slope method are in general only roughly approximate, owing to the difficulty in obtaining accurate data and the uncertainty of the value of n to be used.

WEIR METHOD OF DETERMINING DISCHARGE.—As yet few permanent weirs have been constructed by this survey, but many regular weir measurements are made on small stream-by means of a temporary weir. The weir used consists of a wooden base of 2-inch plank, to which is bolted a rectangular notch of three-eighths inch steel with bevelled edges.

In making a measurement by means of a temporary weir, the following directions should be followed as far as possible. The weir should be placed perpendicular and at right angles to the bed of the stream with the crest level. The discharge should be free in so much as the nappe should have sufficient fall to allow air to have free circulation underneath it, and the head or depth on the crest should not exceed one-third of the length. The channel of approach should be several times as wide as the opening and the depth of water in the bay or pond should be at least twice the head on the weir, so as to eliminate velocity of approach and cross-currents. In choosing a site for a weir, a point should be chosen that will fulfil the above conditions and give a good-sized bay or pond.

To set up a temporary weir, a dam of sods and earth is thrown across the stream, the weir is set in place and the sods are tramped firmly around it to stop all leakage. On a stream with a sandy bed, sods or clay must be placed on the bottom for a few feet upstream to form a mattress to prevent the undermining of the dam.

After the bay has filled up, the head of the water is observed by taking the difference in elevation of the crest of the weir and the elevation of the water surface in the bay at a distance of 4 to 10 feet from the weir, with an engineer's level. Two common methods of getting the elevation of the water surface are: (1) hold the levelling rod on a stone or other solid body under water and subtract the depth of water on the rod from the sight on the rod; (2) drive a pin divided into tenths of feet into the bed of the stream so that an even tenth is level with the surface of the water, then hold the levelling rod on the top of the pin and add the length of pin above the water to the sight on the rod.

When the head of water has been determined, the discharge is computed by using one of the standard formulae which will suit the case. Tables giving the discharges for different heads and lengths of crests are published in many engineering texts.

The formula used by this survey for rectangular sharp-crested weirs is:

$$Q = 3.33 (L - .2H) H^{3/2} \text{ being a modification of Francis' formula, to allow for end contractions and elimination of velocity of approach.}$$

in which Q = discharge in sec. ft.; L = length of crest in feet; H = head in feet.

Measurements by means of temporary weirs should be made some distance above or below the gauge. If they are made close to a gauge, the gauge must be read before the weir is placed in the stream, and the pond must be allowed to run off after the weir is removed before the gauge is re-read.

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Where permanent weirs are installed, the gauge height observed is that of an auxiliary gauge above the weir, which is kept so that the head of the weir can be read direct. The weir is not usually placed so that it will interfere with the regular station, so that if at any time the weir is destroyed the regular gauge can be read during the period that the weir is out of order.

VELOCITY METHOD OF DETERMINING DISCHARGE.—There are two methods of determining the velocity of flow of a stream, namely, direct and indirect. In the direct method, by which the velocity is determined by means of floats, the liability of error is large, and the results far from satisfactory. This method is seldom used except for very rough estimates, or when a current meter cannot be used. There are three common kinds of floats, viz.: surface, sub-surface and tube or rod floats. In each the procedure is the same. A straight piece of channel is selected for the run and two cross-sections are taken at some convenient distance apart, usually from 100 to 200 feet. They are then divided into strips by means of a tagged wire. The velocity in each strip is then measured by noting the time taken by the float in traversing the run or distance between the two cross-sections. As the time and distance are both known the velocity can easily be computed. The velocity, whether measured by surface, sub-surface or tube floats, must be multiplied by a coefficient less than unity to reduce to the mean velocity before being used to compute the discharge.

The indirect or current meter method is the most reliable and most widely used method of determining the velocity of the flow of a stream. The meter used by this survey is the Price Patent, manufactured by W. & L. E. Gurley, Troy, N.Y. It consists of six cups attached to a vertical shaft, which revolves on a conical hardened steel point when immersed in moving water. The number of revolutions is indicated electrically. The rating or relation between the velocity of the moving water and the revolutions of the wheel is determined for each meter by drawing it through still water for a given distance at different speeds and noting the number of revolutions for each run. From this data a rating table is prepared which gives the velocity per second of moving water for any number of revolutions in a given time interval.

In making a measurement with a current meter, a number of points, called measuring points, are measured off above and in the plane of the measuring section, at which observations of depth and velocity are taken. These points are spaced equally for those parts of the section where the flow is uniform and smooth, but should be spaced unequally for other parts according to the discretion and judgment of the engineer. In general, the points should not be spaced farther apart than 5 per cent of the distance between piers, nor farther apart than the approximate mean depth of the section at the time of measurement.

The measuring points divide the total cross-section into elementary strips, at each end of which observations of depth and velocity are made. The discharge of any elementary strip is the product of the average of the depths at the ends, the width of the strip, and the average of the mean velocities at the two ends of the strip. The sum of the discharges of the elementary strips is the total discharge of the stream.

The accuracy of a discharge measurement taken at a velocity area station is dependent on two factors, the accuracy with which the area of the cross-section and the mean velocity of the flow normal to that section are measured. The greatest, and the most common errors in measurements of discharge are caused by erroneous soundings. Errors in soundings by weight and line are due to the weight being carried down-stream, or, sometimes, to the bowing of the line. Both these causes make the soundings too great. Errors in soundings with rods are due to the rod not being perpendicular, to the water rising on the rod, and to the rod sinking in the bed. In order to verify the accuracy of soundings made at medium or high stages, they should be compared with those at low water. The mean velocity is also very difficult to measure accurately, because it is constantly changing. It varies not only from the surface to the bottom, but from one bank of the stream to the other, making it necessary to measure it at a number of points.

METHODS OF DETERMINING MEAN VELOCITY.

There are a number of different methods of determining the mean velocity at the ends of these strips, or, as it is commonly called, the mean velocity in a vertical, namely, multiple-point, single-point, and integration. These three principal multiple-point methods in general use are the vertical velocity-curve, three-point and two-point method.

VERTICAL VELOCITY CURVE METHOD OF DETERMINING MEAN VELOCITY.—In this method the centre of the meter is held as close to the surface of the water as possible, being careful to keep it out of reach of all surface disturbances, and then at a number of different depths throughout the vertical. The velocity at each position of the meter is recorded. These observations are then plotted with velocities in feet per second as abscissae and their corresponding depths in feet as ordinates, and a mean curve is drawn through the points. The mean velocity for the vertical is obtained by dividing the area bounded by the curve and its axis by the depth. In the absence of a planimeter for measuring the area, the depth is divided into 5 to 10 equal parts, and the velocities of the centre ordinates of these parts are noted. The mean of these velocities will very closely approximate the mean in the vertical.

It is often more convenient, when the depth is a number of feet and a fraction, as 7.4, to divide the depth into 7 parts of a foot width, and a part of 0.4 foot width. Then the velocity to enter for the narrow part is 0.4 of the velocity at the centre of it.

The vertical velocity curve is useful in studying the manner in which velocities occur in a vertical. From a study of a number of these curves the other shorter methods of determining mean velocity are deduced. On account of the length of time taken to complete a measurement, this method is not used in general routine measurements, except during the winter, for a change of stage is almost sure to occur during a measurement on a large stream which counterbalances the increased accuracy. For this reason its use is limited to the determination of the coefficient to be used in the reduction of values obtained by other methods of measuring velocity to the true value, to the measurements of velocities under new and unusual conditions of flow, and for measurements under ice.

THREE-POINT METHOD OF DETERMINING MEAN VELOCITY.—This method is one of the short methods of obtaining the mean velocity in the vertical and, under some conditions, gives the most accurate results next to the vertical velocity curve method. It has been used almost exclusively by this survey in past years, during the open water period, but recently has been superseded by the two-point method which, under most conditions, gives more accurate results. In the three-point method, the current-meter is held at 0.2, 0.6, and 0.8 depth. The mean is then obtained by dividing by 4 the sum of the velocities at 0.2 and 0.8 depth plus twice the velocity at 0.6 depth.

TWO-POINT METHOD OF DETERMINING MEAN VELOCITY.—In studying the vertical curves made at a number of different points and under varied conditions, it has been found that the mean of the velocities occurring at 0.2 and 0.8 depth gives very nearly the mean velocity in the vertical. Use is made of this fact in the two-point method of determining mean velocity, the meter being held at 0.2 and 0.8 depth in the vertical. This method has been found more accurate than the single point method and the time required for a metering is not very much greater. This method has been found to give, also, a very close approximate to the mean velocity in measurements of ice-covered streams, although these flow under very different conditions from those of open water.

SINGLE-POINT METHOD OF DETERMINING MEAN VELOCITY.—Experiments made under most favourable conditions and extending over a long period have established the point of mean velocity in a vertical at 0.6 of the depth. Therefore the error resulting from the use of the 0.6 depth as the depth of mean velocity is very small, though in some few cases a study of the vertical velocity curve will show the need of a coefficient to reduce the observed velocities to the mean. The variation of the coefficient from unity in individual cases is, however, greater than in the two or three point method, and the general results are not as satisfactory. For that reason this method is not employed very extensively by the survey.

In the other principal single-point method the meter is held near the surface, at from 0.5 to 1 feet below the surface, care being taken to sink the instrument below the influence of wind or waves. The resulting velocities must be multiplied by a coefficient to reduce them to mean velocities. This coefficient as found by a large number of experiments, varies from 0.78 to 0.98, depending upon the depth and speed of the stream. The deeper the stream and the greater the velocity, the larger the coefficient. In flood work coefficients varying from 0.90 to 0.95 should be used. This method is only used when the current is too strong to permit the sinking of the meter to any great depth below the surface of the water. It is often employed at times of flood, or when a stream is carrying a lot of drift wood or ice.

INTEGRATION METHOD OF DETERMINING MEAN VELOCITY.—This method of determining the mean velocity in a vertical consists in moving the meter at a slow uniform speed from the bed of the stream to the surface and return in a vertical direction, the time and revolutions being observed. In travelling through all parts of the vertical the meter is acted upon by each and every thread of velocity from the bed to the surface of the stream, and the resulting observations determine the mean in that vertical.

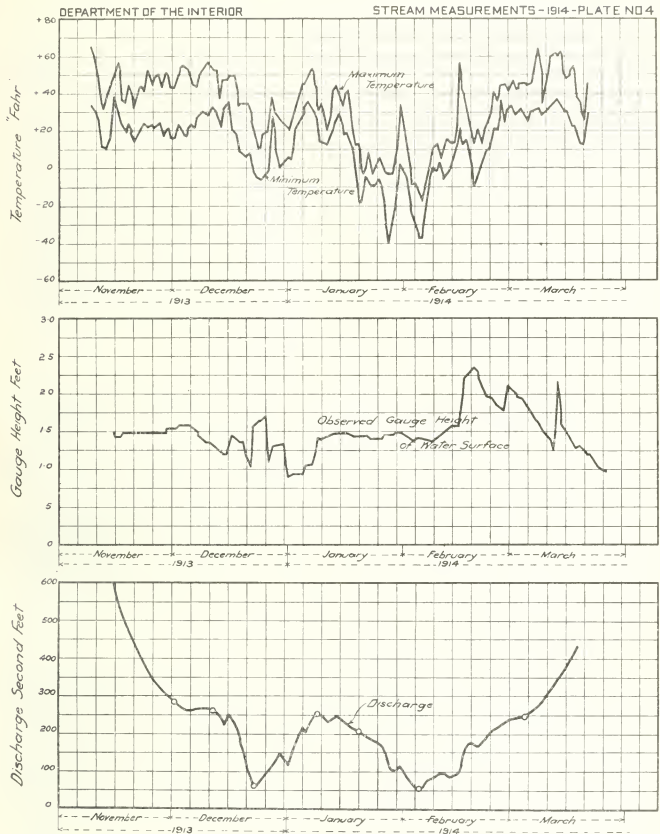
This method is very useful in checking the results of other methods. It is, however, seldom used by this survey, as the Price meter is not suited to observations by this method, since the vertical motion of the meter causes the wheel to revolve.

GAUGING STATIONS.

The first step is to select a suitable locality for a gauging station. Although apparently simple, this is really a difficult task. Not only must the water be moving in nearly straight lines over a solid bed and between well defined banks, but the place must be accessible at moderate cost, and there must be living near it a competent person who can be engaged to serve as observer. Permanent gauging stations should only be selected after a very thorough reconnaissance. In the irrigation districts and in more thickly populated districts there is more or less diversion of water. This is apt to complicate matters for the hydrometric engineer, for a gauging station above all works may not include all the tributaries of the stream, and it is often necessary to establish gauging stations at several points along the streams, and on tributaries, canals, and pipe lines in order to obtain complete information regarding the water supply in a particular stream.

There are three classes of gauging stations, namely, wading, bridge and cable stations. The wading station can of course only be used in the case of small streams having a maximum depth at its highest stage of three feet or less. The equipment for a wading station is small, consisting usually of a plain staff gauge, graduated to feet and hundredths, and fixed vertically to one of the banks of the stream. For convenience a measuring line, usually a wire with tags,

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OBSERVATIONS OF GAUGE HEIGHTS ON ST. MARY RIVER AT WHITNEY'S RANCH WITH CORRESPONDING MAXIMUM AND MINIMUM TEMPERATURES AND THE ESTIMATED DAILY DISCHARGES FOR THE WINTER 1913-1914.

The circles on the discharge graph indicate actual discharge measurements

may be fixed permanently at this section. When taking the reading, the engineer should stand below and to one side of the meter so as not to cause eddies in the water.

Bridge stations, because of their permanency and the freedom of movement allowed the engineer, are much preferred. Very often, however, more particularly in swift currents, the piers materially affect the accuracy of the results. When the gauge cannot be attached to a pier, it is often attached horizontally to the guard-rail or floor of the bridge, and the height of the stream is found by lowering a weight by a chain over a pulley. It is indicated by a marker on the chain. Distances of three, five or ten feet, according to the size of the stream, are marked on the lower chord of the down stream side of the bridge, to serve as a measuring line.

Frequently it is impossible to establish a permanent gauging station at a bridge. In that case the wire cable of a ferry can be utilized, or, if that is not available, a permanent wire cable is stretched across the river. For spans of average length a galvanized wire cable three-fourths of an inch in diameter is safe. It is supported at each bank by means of high struts or by passing it through the crotch of a tree. The cable is run into the ground and anchored securely to a "dead man" buried at least six feet below the surface, or, if convenient, it is anchored to the lower part of the trunk of a tree. A turnbuckle is inserted in the cable between the strut and anchorage to permit tightening the cable when it begins to sag. A permanent measuring line, usually a wire, with tags 5 or 10 feet apart, is stretched across the stream just above the cable. A cage large enough to carry two men and instruments is constructed, and suspended from the cable by means of cast-iron pulleys. The cage is moved from point to point by hand. A stay line, usually quarter-inch guy wire, is stretched across the stream about thirty to forty feet upstream from the cable, and securely fastened. By passing a sash cord through a pulley hung on this stay line the current meter is prevented from being carried downstream. This type of station has the advantage that it can usually be located at the most desirable point on the stream and is free of piers and other obstructions.

LOW VELOCITY LIMITATIONS.

Owing to the presence of a slight amount of friction in the current meter, a certain definite velocity is required to make the wheel revolve, *i.e.*, to overcome the frictional resistance of the wheel. For this reason the meter is unsuitable for the measurement of low velocities approaching this value. This velocity, which is required to overcome friction, and which is obtained from the meter rating curve, is called the velocity of no flow for the particular meter referred to. It varies in different types of meters, and also slightly in meters of the same type, according to the time the meter is in use, but very seldom exceeds 0.2 foot per second in any meter. From a number of observations the low velocity limit, below which values of velocity are unreliable, is found to be 0.5 foot per second. In many cases at low stages the gauging station on a stream becomes unsuitable for a discharge measurement owing to the mean velocity in the section falling below the safe limit. In such instances, where it is possible to wade the stream, a suitable gauging section may be located within a reasonable distance of the regular station and the discharge measurements made at this point. When a gauging is made at a cross-section other than the regular station, sufficient soundings should be made at the latter at the time of the gauging to develop the cross-section and compute the area. The measurement is thus referred to the regular gauging station, and the mean velocity and area at the regular section are reported and used in the office computations.

OFFICE COMPUTATIONS.

RATING CURVES AND TABLES.—When a series of discharge measurements has been made at a gauging station a rating curve is constructed for that station, showing graphically the discharge corresponding to any stage of the stream within the limits covered by the gaugings. This curve, as it is usually drawn, has as abscissae the discharges in second-feet, and as ordinates the corresponding gauge heights at which the discharges were made. A smooth curve is drawn through the resulting set of points, and from this curve the discharges at any stage within the limits of the curve are taken. Some measurements may be more reliable than others, owing to more or less favourable conditions at different times of gauging, or to other causes. In order to obtain the weight of the different measurements, curves with area and mean velocity, as abscissae, and gauge heights as ordinates, are also drawn. From a study of these curves any discrepancies in a measurement, either in its area or mean velocity, may be detected. Should it be necessary to extend the rating curve beyond the limits of actual discharge measurements, the area and mean velocity curves may be constructed to the stages for which the discharge curve is desired, and the latter found by taking the product of the two curves. The discharge curve under natural conditions of flow is always convex to the gauge height axis. The area curve is either a straight line or is convex to the gauge height axis, except in the case of overhanging banks, when it becomes concave to the axis. The mean velocity curve is always concave to the gauge height axis, except in cases where standing water occurs below the stage of no-flow. In this case the curve will assume a reverse form, starting from the gauge height of zero flow with a curve convex to the gauge height axis and gradually reversing to a curve concave to this axis. In plotting all three curves the horizontal and vertical scales should be chosen that the curves may be used within the limits of accuracy for the work, and in their critical position will make, as nearly as possible, angles of 45 degrees with each axis.

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The rating curve being constructed, it becomes necessary to prepare a station rating table, giving the discharge at any stage of the stream within the limits of the daily gauge height observations on record. From this rating table the daily discharges corresponding to the daily gauge heights are read and tabulated. The rating table is constructed for tenths, half-tenths, or hundredths of feet, according to the readings of the gauge to which it is to be applied. The discharges for this table are read directly from the rating curve and are then adjusted so that the differences for successive stages shall be either constant or gradually increasing, but never decreasing, unless the station is affected by backwater.

DAILY DISCHARGE, MONTHLY MEAN, AND RUN-OFF.—The rating table being made to cover the range of daily gauge height observations, the next procedure in the computations is to make out a table of daily discharges from this rating table. The daily gauge heights are copied as they were sent in by the observer, and opposite each the corresponding discharge is filled in from the rating table. The monthly discharge is found by totalling the daily discharges for the month in question, and the monthly mean is obtained by dividing this total by the number of days in the month.

The run-off is computed with two different sets of units, depending upon the kind of work for which the data is intended, as follows:

(1) Run-off in inches is the depth to which a plane surface equal in extent to the drainage area would be covered if all the water flowing from it in a given time were conserved and uniformly distributed thereon; it is used for comparing run-off with rainfall, which is usually expressed in depth in inches. The monthly mean run-off in second-feet is divided by the area of the drainage basin in square miles to find the monthly mean run-off per square mile. This result, reduced to run-off in depth in inches for the monthly period, is in the form required.

(2) The run-off in acre-feet is the form of most use in connection with storage. An acre-foot is equivalent to 43,560 cubic feet, and is the quantity of water required to cover an acre to the depth of one foot. The monthly mean run-off in second-feet is used for the computation of run-off in acre-feet. The monthly mean is reduced to cubic feet per month, and this quantity divided by 43,560 gives the run-off in acre-feet.

The run-off of the stream being computed both in depth in inches and in acre-feet for each month, the run-off for the period during which observations of run-off were made is found by the summation of the amounts of run-off for the several months making up this period.

CHANGING CONDITIONS OF CHANNEL.—On streams such as Milk River, whose bed is in a constant state of motion, measurements of discharge should be made every few days, otherwise considerable data relating to changes cannot be obtained. For discharges on days other than those on which measurements are taken, the interpolation method is used. The two methods of interpolation in general use are the Stout and Bolster methods.

The Stout method deals with the correction of the gauge heights. A curve is drawn, using the difference between the actual gauge heights at the time of measurement and the gauge height corresponding to the measured discharge as ordinates, and the corresponding days of the month as abscissae. From an irregular curve drawn through these points corrections for gauge heights can be made for days on which there was no discharge measurement. When the discharge is greater than that given by the curve the correction is positive, and vice-versa. Each daily gauge height is corrected by the amount shown on the correction curve, and the corresponding discharge taken from an approximate rating curve for the station.

The Bolster method deals more particularly with the modification of the discharge. Results of discharge measurements covering a whole year or season are plotted and, though considerably scattered, will define one or more regular curves, called standard curves, the number and position of each indicating the radical changes. Where the river bed changes from day to day, the position of the standard curve also varies and must pass through the points indicating the different days. The points indicating two successive measurements are joined by a line, which for short distances on the cross-section paper is a straight line, and otherwise a curve. This line is divided into a number of equal parts, each indicating an intervening day, the assumption being that as the change during this period is gradual the daily rating must pass through each point or day, as represented by the divisions. A simple and convenient way of making these interpolations and moving the daily rating curve is to make a tracing of the standard curve with a vertical line of reference. By keeping the lines of reference coincident this curve can be shifted into any desired position and the discharge read for any gauge height.

WINTER RECORDS.

FORMATION OF ICE AND ICE CONDITIONS.—Perhaps the greatest difficulties in stream measurements are met with in the early part of the winter, just as the streams are commencing to freeze up. Especially is this true in the swift running streams in or near the mountains. Needle and anchor ice often form in large quantities in rapids and, flowing in masses with the water, make gaugings very difficult and unreliable. Even after a permanent ice cover is obtained at the gauging station this ice will, in some cases, obstruct the channel below the station and cause "backwater."

A further difficulty is that the surface ice usually forms along the edges of the stream for some time before forming in the centre of the channel. At first this may be broken away if the stream is small and open water measurements made, but later it is necessary to take some

observations through holes in the ice along the edge. As the streams get farther away from the mountains their velocity decreases, and fewer rapids occur along their course. There is then less trouble with needle and anchor ice, and a permanent ice cover forms much more quickly.

In many cases the section used during the summer is very unsuitable for making measurements during the winter. It may be (a) too wide and shallow or flowing in two channels during the winter, due to low water; (b) partially open, due to swift running water or warm water running in; (c) affected by needle and anchor ice, either by flowing in the water, or causing backwater; (d) located where the snow drifts over the ice to a great depth; (e) that it is likely to have a rough ice cover or pile up with ice, due to swift water and a rough bed; (f) that there is a tendency for ice jams to occur, with consequent backwater, etc.

It is therefore often necessary to choose a new section for winter observations. This should be done before freeze-up, for then the width, depth, uniformity of flow and conditions above and below can be easily noted. The most suitable stations for winter measurements are those which have a long stretch of very smooth, sluggish water above, and a rapid fall below.

DISCHARGE MEASUREMENTS.—In winter as in summer, the daily discharges of a stream are computed from frequent discharge measurements, and daily gauge height observations. The discharge measurements are made through holes in the ice from five to ten or even twenty feet apart, depending upon the size of the stream, and large enough to allow the current meter to pass through freely. The gaugings are made in the same manner as at open sections except that the depth of the stream is taken as the distance from the bottom of the ice to the bed of the stream. The soundings, however, are always referred to the surface of the water in the holes, the distance from the surface of the water to the bottom of the ice being measured and subtracted from the soundings to obtain the depth.

The vertical velocity curve method is usually used for the determination of the mean velocity in the vertical. A curve is plotted for each vertical, and the mean velocity is determined in the usual manner. These curves vary greatly as to form for different kinds and conditions of channel.

The typical curve, however, differs from that obtained from an open water observation in that it is drawn back more at the surface, owing no doubt to greater friction between the ice and the water as compared with the water and the atmosphere. As a result there are two points in the vertical at which the thread of mean velocity occurs under an ice cover. These points are near 0.2 and 0.8 of the total depth below the bottom of the ice, and the mean of the velocities at these two depths will give fairly accurate results, but when close estimates of the discharges are required, and the conditions are not very favourable, the vertical velocity method should be used.

It is found that when all the holes are opened on a small swift stream, there are sometimes vertical pulsations of the water in the holes, which affect the velocity readings. This can usually be avoided by only opening one hole at a time, and filling it in again with ice and snow as soon as the observation is finished. It can also be overcome by inserting a thin sheet of galvanized tin or iron at the bottom of the hole after the meter has been lowered into the water. The meter should always be held near the upstream side of the hole.

In using the meter care must be taken to keep it under the water as much as possible to prevent ice from forming around the bearings. It is a good plan to clean and oil the meter indoors before starting out to make a gauging.

GAUGES AND GAUGE OBSERVATIONS.—The gauge is usually read once each day, the observer noting the elevation of the water as it rises in a hole cut through the ice, the height of the top of the ice, the thickness of the ice, presence of needle or slush ice, snow on top of ice, ice jams, and any sudden changes in temperature. To do this the observers are provided with an ice chisel for chopping holes, and an L-shaped ice scale to measure the thickness of the ice.

A difficulty which arises in obtaining the thickness of the ice is that in a hole kept open for some time the ice wears away around the bottom of the hole, and may make it necessary to cut a new hole near by, or to enlarge the original.

Any form of gauge may be used, but the chain gauge is the most satisfactory, as the staff gauge, being frozen to the ice, heaves with it, and also in cutting away the ice from around it the figures are effaced. The automatic gauge gives trouble with the well freezing over.

ESTIMATES OF DAILY DISCHARGE.—While the run-off, particularly during the winter months, does not vary directly in accordance with the precipitation, the rate at which it reaches the streams is, of course, dependent almost entirely upon the climatic conditions. The climate in the mountains is subject to great extremes, but during the winter almost the entire precipitation is in the form of snow.

There is, therefore, very little surface run-off, and the flow of the streams comes almost entirely from the glaciers, ground waters and lake storage, and except for the losses due to freezing and the slight increases, due to the melting of snow and ice by chinooks (warm winds), the flow in the streams would remain constant or would change gradually.

There are, however, certain local conditions in Western Canada which make it exceptionally difficult to make estimates of the daily discharge during the winter. The gauge height in many cases fluctuates very much, and often sudden rises or drops occur. These rises are often explained by the fact that during very cold spells a great deal of slush, frazil,

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and anchor ice is formed and chokes up the channel, thus raising the surface of the water, when in reality the discharge is decreasing. Then, again, a chinook causes a sudden rise in temperature and the discharge is often increased, while at the same time the gauge height gradually lowers, evidently because the warmer weather and water have melted out a lot of the ice from the channel and given it a greater carrying capacity.

In order to make reliable estimates of the daily discharge, gaugings must be made at short intervals and the weather conditions and temperatures in the whole of the drainage area above the stations must be very carefully studied.

W. G. Hoyt, District Engineer, Water Resources Branch, U.S. Geological Survey, has made an exhaustive study of methods for estimating the flow when streams are frozen. The various methods described by him in an article in "Engineering News" on April 10, 1913, and Water-Supply Paper 337, published by the United States Geological Survey, in 1913, and modifications of them, are used. The graphic method of interpolation has been found to be generally applicable, but as the precipitation during the winter months has so little effect upon the run-off during that period, it is seldom plotted on the sheets. It is also considered that the extremes and ranges of temperatures are better guides for interpolation than the mean temperatures, and the minimum and maximum temperatures are both plotted and given due consideration rather than the mean temperatures.

The weather conditions and temperatures at the gauging station are not always typical for the whole drainage basin above, and care must therefore be taken to have the meteorological observations made at some other place, or, if necessary, at two or more places. Of course, care must be taken to study all the possible conditions which may affect the estimates.

Plate 4 shows typical conditions and illustrates the graphic method of interpolating the daily discharges.

Additional information on this subject may be found in the appendix of this report.

RATING CURRENT-METERS.

Each meter is rated before being used, in order to determine the relation between the revolutions of the wheel and the velocity of the water. The meter is driven at a uniform rate of speed through still water for a given distance, and the number of revolutions of the wheel and the time are recorded. From this data the number of revolutions per second and the corresponding velocity per second are computed. Tests are made for speeds varying from the slowest which will cause the wheel to revolve to several feet per second. The results of these runs, when plotted with revolutions per second as abscissae, and velocity in feet per second as ordinates, locate points that define the meter rating-curve, which for all meters is practically a straight line. From this curve a meter rating table is prepared. Theoretically, the rating for all meters of the same make and type should be the same, but as the result of slight variations in construction and in the bearing of the wheel on the axis at different velocities, the ratings differ.

After a meter has been in use for some time the cups may have received small injuries, or the bearing of the wheel on the axis may have changed owing to unavoidable rough usage. These changes will affect the running of the meter and change its rating. As a consequence, each meter is re-rated at regular intervals and a new rating curve and table prepared.

Descriptions of the rating station, discussions of the methods employed, and the results of ratings, are given in the Reports of Progress of Stream Measurements for the years 1911 and 1912.

ATHABASKA RIVER DRAINAGE BASIN.

General Description.

Athabaska River rises on the eastern slope of Rocky Mountains and flows in a north-easterly direction for about one thousand miles, eventually emptying into Lake Athabaska.

The Athabaska basin forms the most southerly portion of the great Mackenzie system, and the portion dealt with in this report comprises only the headwaters.

Rising in country very similar to the watershed of the other streams of importance in Alberta, it flows out of the mountains and then through foothill country. From the foothills to the lake the basin consists of stretches of muskeg and uplands, well timbered with spruce and pine.

The general character of the basin is such that the winter precipitation or snow cover is conserved to a great extent, and floods in the early spring are not usual. However, in June, July and August rains and warm winds cause the upper parts of the system to discharge large quantities of the snow water from the higher peaks and glaciers, and when rains of any magnitude occur the invariable result is a flood. The muskeg country is a great source of storage, but, when its capacity is reached, it accelerates rather than retards the run-off.

The main transcontinental lines of the Grand Trunk Pacific and the Canadian Northern Railways cross the upper portion of this drainage basin, and transportation is now a much easier problem than in the past.

Many valuable deposits of coal, limestone and other minerals are found in this basin, and, on account of these as well as the many power possibilities and stretches of timber and pulpwood, it is expected that this country will develop very much during the next few years.

During 1913 a few stations were established in this basin, and a regular hydrometric engineer employed, who made a number of miscellaneous measurements. As the country is settled more stations will be established where necessary, and much better records obtained.

A very full description of this drainage is attached as an appendix to the 1913 report.

MIETTE RIVER NEAR JASPER.

Location.—On the SW. $\frac{1}{4}$ Sec. 9, Tp. 45, Rge. 1, W. 6th Mer., at a traffic bridge about two miles southwest of Jasper, and about one mile from the mouth of the river.

Records available.—From May 23, 1914, to December 31, 1914. Discharge measurements available from February 13, 1913, to December 31, 1914.

Gauge.—Vertical staff, on downstream side of bridge pier about 20 feet from the left bank.

Bench-marks.—Six-inch spike driven in 15-inch spruce tree on the left bank of the river, and about 30 feet east of the gauge; elevation 10.76 feet above the zero of gauge.

Channel.—Three channels at all stages, slightly shifting.

Discharge measurements.—Made from bridge.

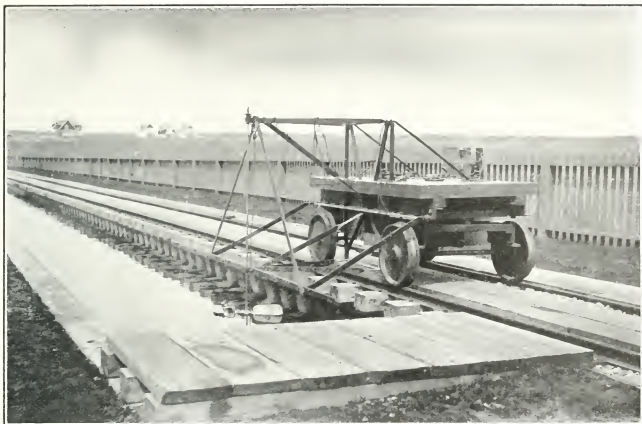
Winter flow.—River affected by ice from November to April. Discharge measurements made at a point about 1,000 feet downstream from regular section.

Observer.—Matt. Crevie.

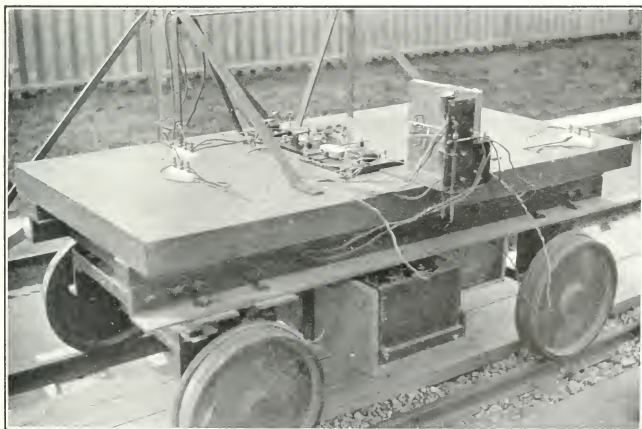
DISCHARGE MEASUREMENTS of Miette River near Jasper, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 22.	P. H. Daniells.	39	51	0.46	.....a	23
Mar. 6.	do	47	47	0.56	.....a	26
April 16.	do	50	82	1.80	.....a	148
May 14.	do	73	423	1.42	3.60	600
May 23.	do	76	522	1.84	4.09	963
June 11.	do	76	612	1.81	4.95	1,109
June 26.	do	75	548	2.55	4.54	1,177
July 13.	do	76	690	2.19	5.49	1,511
July 28.	do	71	530	1.57	3.74	832
Aug. 11.	do	73	377	1.05	1.80	394
Aug. 22.	do	77	385	1.03	1.98	401
Sept. 9.	do	72	317	0.83	1.05	263
Sept. 23.	do	74	328	0.96	1.11	314
Oct. 10.	do	74	280	1.05	1.10	296
Oct. 22.	do	74	260	0.54	0.41	140
Oct. 31.	do	53	90	1.77	0.56	159
Nov. 13.	do	54	109	1.10	0.46	120
Nov. 28.	do	48	68	1.22	0.30	82
Dec. 24.	do	43	110	0.22	1.06	24

a No gauge.



View of the Car at the Current-meter Rating Station at Calgary, Alberta, showing the Apparatus for suspending the Current-meter in the Tank.
Taken by H. M. Nelson.



View of the Car at the Current-meter Rating Station at Calgary, Alberta, showing the Recording Apparatus. Taken by H. M. Nelson.

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DAILY GAUGE HEIGHT AND DISCHARGE of Miette River near Jasper, for 1914.

DAY.	May.		June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.62	742	6.30	1,887	2.90	607
2.....			5.40	1,388	6.22	1,852	2.85	595
3.....			7.35	2,232	6.27	1,874	2.76	574
4.....			7.20	2,152	6.35	1,900	2.62	542
5.....			6.60	1,878	6.32	1,896	2.50	516
6.....			5.87	1,548	5.87	1,698	2.43	501
7.....			5.68	1,490	5.33	1,460	2.32	478
8.....			5.43	1,330	5.10	1,360	2.18	450
9.....			5.05	1,165	5.22	1,412	1.90	397
10.....			4.90	1,097	5.27	1,434	1.85	388
11.....			4.95	1,110	5.35	1,469	1.72	365
12.....			5.20	1,233	5.37	1,478	1.60	345
13.....			6.00	1,595	5.20	1,403	1.67	357
14.....			6.95	2,030	5.13	1,373	1.73	367
15.....			7.05	2,100	5.05	1,338	1.80	379
16.....			7.23	2,198	4.73	1,206	1.89	395
17.....			7.60	2,377	4.46	1,100	1.90	397
18.....			7.50	2,352	3.98	926	1.85	388
19.....			6.90	2,112	3.40	744	1.82	383
20.....			5.70	1,600	3.60	803	1.80	379
21.....			5.05	1,338	4.35	1,060	1.85	388
22.....			4.40	1,078	3.75	850	1.92	401
23.....	4.09	965 ^a	4.33	1,052	3.68	828	1.65	354
24.....	3.97	913	4.00	933	3.20	687	1.40	313
25.....	3.60	785	4.15	987	3.56	791	1.37	308
26.....	3.64	790	4.55	1,135	3.43	753	1.30	298
27.....	3.00	605	5.00	1,317	3.55	788	1.40	313
28.....	2.45	477	5.20	1,403	3.74	847	1.28	295
29.....	2.05	396	5.40	1,491	3.39	741	1.25	290
30.....	1.85	355	6.00	1,755	3.24	698	1.22	286
31.....	2.80	537	.....	.....	3.12	665	1.18	280

^a Station established.

DAILY GAUGE HEIGHT AND DISCHARGE of Miette River near Jasper, for 1914.

DAY	September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.15	276	2.32	528	0.53	188	0.31	70
2.....	1.10	268	2.03	464	0.49	183	0.16	65
3.....	1.08	265	1.79	416	0.43	174	0.14	60
4.....	0.94	246	1.40	350	0.39	169	0.10	56
5.....	0.88	237	1.32	333	0.36	165	0.09	55
6.....	0.85	233	1.25	323	0.34	161	0.12	57
7.....	0.82	229	1.16	307	0.29	156	0.27	58
8.....	0.86	234	1.10	296	0.24	149	0.22	55
9.....	0.95	247	1.07	293	0.27	153	0.16	40
10.....	0.89	243	1.02	285	0.25	150	0.28	35
11.....	0.85	237	0.78	243	0.32	1406	0.42	33
12.....	0.82	237	0.84	248	0.39	130	0.46	32
13.....	0.73	228	0.80	240	0.48	120	0.52	33
14.....	0.68	223	0.76	228	0.46	114	0.54	33
15.....	0.63	218	0.74	223	0.52	102	0.55	35
16.....	0.59	215	0.77	220	0.49	91	0.63	33
17.....	0.55	208	0.80	218	0.50	97	0.72	35
18.....	0.87	258	0.83	217	0.52	98	0.76	40
19.....	1.14	305	0.79	205	0.55	100	0.85	35
20.....	1.07	298	0.65	183	0.49	103	0.92	30
21.....	1.05	299	0.52	158	0.43	102	0.88	35
22.....	1.04	297	0.35	133	0.40	95	0.91	30
23.....	1.12	315	0.38	135	0.37	91	0.87	27
24.....	1.08	305	0.44	144	0.36	94	1.12	24
25.....	1.22	330	0.37	134	0.40	96	1.30	23
26.....	1.71	411	0.40	138	0.38	98	1.38	18
27.....	2.83	657	0.33	128	0.34	90	1.35	24
28.....	2.76	640	0.25	118	0.30	82	1.45	30
29.....	2.72	627	0.30	125	0.25	78	1.54	35
30.....	2.78	643	0.47	145	0.00	75	1.30	35
31.....			0.55	157			1.22	406

b Ice conditions Nov. 11-Dec. 31.



View of Athabaska River near Hinton, Alberta. Taken by G. H. Whyte.



Boat used for making Discharge Measurements of Athabaska River at Athabaska, Alberta.
Taken by G. H. Whyte.

SESSIONAL PAPER No. 25c

MONTHLY DISCHARGE of Miette River near Jasper, for 1914.

(Drainage area 258 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (23-31).....	965	355	647	2.508	0.84	11,550
June.....	2,377	742	1,541	5.973	6.66	91,699
July.....	1,909	665	1,204	4.607	5.38	74,028
August.....	607	280	338	1.542	1.78	24,472
September.....	657	208	314	1.217	1.36	18,684
October.....	528	118	237	0.919	1.06	14,573
November.....	188	75	121	0.469	0.52	7,200
December.....	70	18	39	0.151	0.17	2,398
The period.....					17.77	244,604

ATHABASKA RIVER AT JASPER.

Location.—On the NW. $\frac{1}{4}$ Sec. 15, Tp. 45, Rge. 1, W. of 6th Mer., about one-half mile east of the Grand Trunk Pacific Station and three-quarters of a mile below the mouth of the Miette River.

Records available.—March 4, 1913, to December 31, 1914.

Gauge.—Vertical staff; datum maintained at 83.81 feet during 1913, and at 83.83 feet during 1914.

Bench-mark.—Permanent iron bench-mark, assumed elevation 100.00 feet.

Channel.—Slightly shifting.

Discharge measurements.—Made from cable car.

Winter flow.—River affected by ice from November to April. Discharge measurements made at a point about $1\frac{1}{2}$ miles below the regular station.

Observer.—Gauge read by G. Thompson from January 1, 1914, to July 19, 1914, and by Matt. Crevie from July 19, 1914, to December 31, 1914.

DISCHARGE MEASUREMENTS of Athabaska River at Jasper, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 7.....	P. H. Daniells.....	200	222	2.27	2.98	503
Jan. 23.....	do.....	275	543	0.80	4.33	434
Feb. 13.....	do.....	139	144	2.24	4.78	323
Mar. 5.....	do.....	170	164	2.27	2.38	364
Mar. 31.....	do.....	140	131	2.42	2.28	317
April 17.....	do.....	186	229	3.56	3.05	818
May 11.....	do.....	228	349	3.85	3.76	1,334
May 26.....	do.....	364	911	4.88	5.84	4,447
June 12.....	do.....	431	1,384	5.18	7.09	7,167
June 27.....	do.....	407	1,475	5.67	7.64	8,341
July 14.....	do.....	434	1,837	8.11	9.08	15,102
July 31.....	do.....	408	1,486	5.56	7.33	8,273
Aug. 10.....	do.....	405	954	5.45	6.00	5,205
Aug. 24.....	do.....	407	1,096	5.10	6.16	5,591
Sept. 12.....	do.....	262	499	5.90	4.52	2,949
Sept. 24.....	do.....	250	453	4.61	3.95	2,087
Oct. 7.....	do.....	248	437	4.92	3.88	2,136
Oct. 21.....	do.....	243	350	4.35	3.45	1,523
Nov. 13.....	do.....	188	201	3.61	2.64	726
Nov. 30.....	do.....	186	243	2.96	2.53	720
Dec. 26.....	do.....	120	220	2.16	4.24	476

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Jasper, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	4.18	500 ^a	5.33	380	2.83	280	2.28	340	3.20	820	5.54	3,904
2.	4.06	516	5.44	368	1.88	338	2.33	360	3.25	875	6.88	6,580
3.	3.93	524	5.24	351	1.23	362	2.33	385	3.40	1,040	8.01	9,946
4.	3.98	531	5.63	340	0.83	371	2.33	412	3.60	1,260	7.86	9,410
5.	3.58	532	5.67	318	2.43	364	2.33	438	3.68	1,348	7.27	7,599
6.	3.40	524	5.68	291	2.53	370	2.58	463	3.75	1,430	7.32	7,736
7.	3.08	503	5.62	278	2.50	368	2.58	490	3.77	1,454	7.52	8,300
8.	2.73	492	5.54	287	2.48	360	2.58	520	3.80	1,490	6.86	6,530
9.	3.14	478	5.55	330	2.43	360	2.58	555	3.73	1,406	6.79	6,357
10.	3.33	470	5.50	330	2.33	385	2.63	583	3.65	1,315	6.58	5,888
11.	2.78	480	5.48	280	2.38	388	2.63	612	3.80	1,490	6.85	6,505
12.	2.68	520	5.98	291	2.50	340	2.83	641	3.95	1,670	7.05	7,020
13.	2.63	525	4.68	323	2.58	332	2.93	678	4.20	1,970	7.43	8,040
14.	2.54	528	3.93	342	2.53	344	3.08	700 ^a	4.43	2,259	8.10	10,260
15.	2.48	539	3.73	360	2.48	341	3.13	750	4.70	2,620	8.40	11,420
16.	2.60	549	3.71	360	2.45	330	3.23	853	4.78	2,732	8.56	12,040
17.	2.68	557	3.78	350	2.43	320	3.10	720	4.85	2,835	8.87	13,360
18.	2.77	540	3.78	328	2.42	326	3.05	670	4.73	2,662	8.90	13,440
19.	3.83	519	3.78	300	2.41	335	3.00	620	4.60	2,480	8.37	11,120
20.	3.96	490	3.68	325	2.48	340	2.95	575	4.67	2,578	7.68	8,640
21.	4.13	462	3.68	328	2.50	346	2.80	440	4.70	2,620	7.30	7,540
22.	3.98	447	3.68	326	2.58	360	2.80	440	4.76	2,704	6.92	6,480
23.	4.33	434	3.68	310	2.78	342	2.90	530	5.60	4,000	6.55	5,640
24.	4.43	414	3.73	322	3.08	310	2.90	530	6.10	4,900	6.28	5,260
25.	4.48	406	3.78	333	3.38	280	3.00	620	6.25	5,200	6.50	5,520
26.	4.53	411	3.76	336	3.03	271	3.00	620	5.65	4,080	7.10	6,880
27.	4.58	408	3.73	298	2.60	280	3.00	620	5.30	3,520	7.50	7,920
28.	5.83	371	3.67	243	2.48	286	3.05	670	5.11	3,225	7.63	8,400
29.	5.88	354	.....	.....	2.38	293	3.05	670	4.67	2,578	7.86	9,280
30.	5.53	364	.....	.....	2.33	309	3.10	720	4.58	2,454	8.10	10,260
31.	5.48	380	.....	.....	2.28	317	.....	.....	4.78	2,732	.....	.....

^a Ice conditions Jan. 1 to Apr. 14.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Jasper, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	8.55	12,160	7.32	8,258	5.82	4,876	5.13	3,775	3.12	1,212	2.54	715
2	8.95	14,080	7.50	8,790	5.65	4,590	4.74	3,216	3.10	1,190	2.47	690
3	9.24	15,480	7.67	9,341	5.60	4,510	4.43	2,782	3.06	1,146	2.46	645
4	9.40	16,320	7.80	9,780	5.45	4,270	4.13	2,389	3.02	1,102	2.44	600
5	9.27	15,780	7.68	9,374	5.27	3,992	4.00	2,220	3.05	1,135	2.47	575
6	8.80	13,640	7.40	8,490	5.20	3,880	3.86	2,052	3.03	1,113	2.47	570
7	8.48	12,320	7.10	7,650	5.17	3,835	3.97	2,184	3.00	1,080	3.83	570
8	8.28	11,540	6.55	6,320	5.16	3,820	3.90	2,100	2.97	1,050	4.90	573
9	8.20	11,200	6.15	5,500	5.10	3,730	3.88	2,076	3.01	1,091	6.01	573
10	8.49	12,420	5.70	4,670	4.92	3,468	3.95	2,160	2.94	1,020	5.54	533
11	8.87	14,120	5.78	4,806	4.68	3,132	3.74	1,908	2.90	980	4.75	490
12	9.10	15,200	5.85	4,930	4.56	2,964	3.78	1,956	2.82	908	4.25	488
13	9.00	14,760	6.07	5,343	4.20	2,480	3.70	1,860	2.65	726	5.24	503
14	9.05	14,990	6.45	6,105	4.09	2,337	3.75	1,920	2.70	700b	4.04	518
15	8.54	12,716	6.63	6,499	3.94	2,148	3.72	1,884	2.60	675	4.12	515
16	8.11	10,931	6.47	6,147	3.83	2,016	3.94	2,148	2.32	660	4.16	522
17	7.83	9,882	6.38	5,960	3.74	1,908	4.05	2,285	2.54	677	4.20	530
18	7.66	9,308	6.34	5,880	3.97	2,184	3.86	2,052	2.84	690	4.28	530
19	8.31	11,751	6.42	6,042	4.22	2,506	3.74	1,908	2.90	700	4.36	500
20	8.26	11,546	6.40	6,000	3.99	2,208	3.61	1,752	2.87	708	4.43	487
21	8.16	11,136	7.00	7,390	3.85	2,040	3.43	1,553	2.80	710	4.55	500
22	7.81	9,814	7.05	7,520	3.74	1,908	3.25	1,355	2.70	706	4.52	540
23	7.76	9,644	6.94	7,240	3.85	2,040	3.27	1,377	2.73	700	4.45	540
24	7.01	7,416	6.00	5,210	4.01	2,233	3.23	1,333	2.72	696	4.33	520
25	7.21	7,948	6.08	5,362	4.23	2,519	3.17	1,267	2.76	710	4.35	495
26	7.16	7,812	6.10	5,400	4.83	3,342	3.25	1,355	2.84	732	4.25	480
27	7.26	8,088	6.47	6,147	5.61	4,526	3.14	1,234	2.80	732	4.18	500
28	6.81	6,924	6.35	5,900	5.43	4,238	3.04	1,124	2.65	720	4.10	500
29	7.11	7,677	6.12	5,440	5.34	4,094	3.05	1,135	2.59	715	3.85	500
30	7.21	7,948	6.03	5,267	5.23	3,928	3.09	1,179	2.38	723	3.80	508
31	7.15	7,785	5.94	5,096			3.16	1,256			3.65	523b

b Ice conditions Nov. 14 to Dec. 31.

MONTHLY DISCHARGE of Athabaska River at Jasper, for 1914.

(Drainage area 1,600 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January	557	354	476	0.298	0.34	29,268
February	380	243	356	0.348	0.36	30,879
March	388	271	334	0.200	0.24	20,537
April	833	340	574	0.359	0.40	34,155
May	5,200	820	2,379	1.488	1.72	146,279
June	13,440	3,904	8,242	5.151	5.75	490,430
July	16,320	6,924	11,366	7.104	8.19	698,892
August	9,780	4,670	6,512	4.070	4.69	400,404
September	4,876	1,908	3,191	1.994	2.22	189,879
October	3,775	1,124	1,897	1.186	1.37	116,637
November	1,212	660	857	0.535	0.60	50,995
December	715	480	540	0.338	0.39	33,203
The year					26.27	2,241,558

MALIGNE RIVER NEAR JASPER.

Location.—On the SW. $\frac{1}{4}$ Sec. 1, Tp. 46, Rge. 1, W. 6th Mer., about $4\frac{1}{2}$ miles northeast of Jasper and about 400 feet from the point where the Maligne enters the Athabaska.

Records available.—Discharge measurements from June 29, 1914, to December 31, 1914.

Drainage area.—448 square miles.

Gauge.—Vertical staff on right bank of river about 250 feet upstream from cable support.

Bench-mark.—Six-inch spike driven in a 15-inch spruce stump on right bank of the river, and about 4 feet north of the gauge, elevation 8.38 feet above zero of gauge.

Channel.—One channel at all stages, fairly permanent.

Discharge measurements.—Made from cable and car.

Winter flow.—Not affected by ice.

Observer.—None.

DISCHARGE MEASUREMENTS of Maligne River near Jasper, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 26	P. H. Daniells	45	42	2.55	....<i>a</i>	108
Feb. 12	do	32	43	2.05	....<i>a</i>	87
Mar. 4	do	25	40	2.10	....<i>a</i>	84
April 1	do	54	59	1.12	....<i>a</i>	66
April 17	do	57	71	1.32	....<i>a</i>	94
May 12	do	62	109	2.35	....<i>a</i>	256
June 29	do	90	273	6.64	3.50	1,814
July 16	do	90	274	6.64	3.46	1,817
July 30	do	87	261	5.98	3.33	1,561
Aug. 13	do	87	254	4.95	3.86	1,260
Aug. 26	do	87	262	5.58	3.23	1,461
Sept. 11	do	87	251	5.73	3.10	1,440
Sept. 25	do	76	157	3.73	2.01	570
Oct. 8	do	76	150	3.54	1.97	531
Oct. 24	do	73	118	2.68	1.55	316
Nov. 14	do	60	93	1.90	1.07	177
Dec. 24	do	57	73	1.50	0.60	110

a No gauge.

ROCKY RIVER NEAR HAWES.

Location.—On the NW. $\frac{1}{4}$ Sec. 13, Tp. 48, Rge. 28, W. 5th Mer., about three-quarters of a mile east of Hawes station and about 300 yards from the point where the Rocky enters the Athabaska River.

Records available.—June 9, 1913, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 90.91 feet since establishment.

Bench-mark.—On right concrete abutment; assumed elevation 100.00 feet.

Channel.—Shifting.

Winter flow.—River affected by ice from November to April. Discharge measurements made at a point about one mile above station.

Observer.—C. Picarell.

SESSIONAL PAPER No. 25c

DISCHARGE MEASUREMENTS of Rocky River near Hawes, in 1914.

DATE.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 5.	P. H. Daniells.	80	82	1.58	4.26	129
Feb. 11.	do	38	45	1.47	5.31	67
Mar. 30.	do	57	100	0.88	5.01	88
April 15.	do	83	70	2.40	4.29	169
May 15.	do	115	175	3.72	2.98	651
May 29.	do	121	182	2.49	2.88	454
June 18.	do	194	460	5.40	4.11	2,488
July 3.	do	200	446	5.73	4.01	2,552
July 17.	do	149	270	4.06	3.80	1,097
Aug. 3.	do	136	184	3.70	3.45	682
Aug. 14.	do	128	190	2.65	3.29	503
Sept. 14.	do	128	152	2.41	3.08	366
Sept. 28.	do	126	176	3.14	3.08	553
Oct. 9.	do	126	175	2.61	3.21	456
Oct. 27.	do	114	141	1.89	2.80	267
Nov. 16.	do	34	35	2.66	4.85	94
Dec. 2.	do	53	64	1.56	4.81	100
Dec. 28.	do	35	38	2.66	5.76	101

DAILY GAUGE HEIGHT AND DISCHARGE of Rocky River near Hawes, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	4.19	120a	5.29	69	4.80	70	4.93	94	2.07	265	3.27	719
2.	3.99	124	5.19	65	4.87	71	5.08	96	2.18	279	3.61	1,140
3.	3.96	126	4.92	60	4.87	71	5.13	100	2.30	296	3.80	1,531
4.	4.25	129	5.17	57	4.97	72	5.17	113	2.25	289	3.86	1,729
5.	4.29	129	4.41	53	4.77	72	5.13	118	2.15	277	3.55	1,048
6.	4.26	124	5.03	60	4.53	72	5.22	122	2.12	272	3.61	1,140
7.	4.29	118	5.13	64	4.91	72	5.24	126	2.14	274	3.95	2,161
8.	4.15	113	5.47	68	5.03	72	5.21	134	2.25	289	3.71	1,328
9.	3.91	108	5.59	72	5.00	70	5.11	152	2.35	304	3.71	1,328
10.	1.79	108	5.37	70	3.36	68	4.85	155	2.53	339	3.78	1,486
11.	0.26	110	5.42	67	3.46	72	4.83	156	2.52	336	3.79	1,508
12.	4.07	108	4.81	64	4.55	75	4.58	161	2.61	359	3.81	1,564
13.	4.13	104	5.13	66	5.11	76	4.25	163	2.68	380	3.87	1,762
14.	4.11	100	4.99	68	5.17	74	4.33	166	2.92	476	3.95	2,161
15.	4.11	100	5.10	72	5.13	72	4.20	169	2.99	511	4.09	3,253
16.	4.16	101	4.67	68	5.15	73	3.18	240a	3.13	780	4.17	3,964
17.	4.25	100	4.48	65	5.13	74	2.41	313	3.06	705	4.17	3,964
18.	3.59	91	4.43	63	4.97	70	2.14	274	2.93	590	4.09	3,233
19.	2.33	86	3.85	62	4.90	66	2.13	273	2.87	550	4.01	2,549
20.	2.24	81	3.46	62	4.89	64	2.10	269	2.79	490	3.89	1,828
21.	2.26	78	3.77	63	4.97	72	2.02	259	2.80	485	3.79	1,508
22.	2.28	75	4.01	65	5.13	78	1.99	255	2.91	540	3.73	1,374
23.	2.30	76	4.35	67	5.09	80	2.03	260	3.25	810	3.74	1,496
24.	2.32	70	4.68	69	4.97	78	2.01	257	3.53	1,150	3.67	1,250
25.	2.34	72	4.63	71	4.75	77	1.98	254	3.56	1,170	3.85	1,696
26.	4.49	73	4.66	72	4.59	77	1.95	251	3.34	860	3.81	1,564
27.	4.97	68	4.81	72	4.64	81	1.93	249	3.16	665	3.79	1,508
28.	4.83	62	4.73	68	4.89	86	1.95	251	3.01	535	3.83	1,630
29.	5.01	70			5.16	89	1.97	253	2.87	452	3.99	2,401
30.	5.13	76			5.03	88	1.99	255	2.79	418	3.95	2,161
31.	5.25	77			5.03	92			2.90	466		

a Ice conditions Jan. 1 to April 16.

DAILY GAUGE HEIGHT AND DISCHARGE of Rocky River near Hawes, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	3.90	1,861	3.41	620	3.23	471	3.23	625	2.80	270	4.66	101
2.....	4.07	3,077	3.41	620	3.18	438	3.23	605	2.78	264	4.78	100
3.....	4.06	2,989	3.43	640	3.15	420	3.23	582	2.78	264	4.77	98
4.....	4.05	2,901	3.47	680	3.15	420	3.20	540	2.77	261	4.77	96
5.....	4.19	4,150	3.43	640	3.13	408	3.17	505	2.77	261	4.75	94
6.....	4.16	3,800	3.42	630	3.11	396	3.15	480	2.77	261	4.81	96
7.....	4.05	2,890	3.40	610	3.09	385	3.15	460	2.78	264	4.87	98
8.....	4.09	3,253	3.37	583	3.07	375	3.18	460	2.66	232	5.07	99
9.....	4.32	5,290	3.35	547	3.16	426	3.20	456	2.61	222	4.55	97
10.....	4.33	5,290	3.33	547	3.14	414	3.18	438	2.61	222	4.81	94
11.....	4.17	3,700	3.29	513	3.13	408	3.16	426	2.87	187 ^b	4.45	94
12.....	4.25	4,300	3.29	513	3.13	408	3.15	420	3.01	151	5.88	96
13.....	4.24	4,000	3.28	506	3.11	396	3.13	408	3.48	127	5.65	98
14.....	4.17	3,070	3.30	520	3.09	370	3.09	385	3.95	114	5.73	100
15.....	4.13	2,500	3.30	520	3.07	380	3.05	365	4.42	100	5.82	103
16.....	3.95	1,500	3.29	513	3.06	390	3.05	365	4.91	94	6.14	106
17.....	3.77	1,060	3.31	529	3.03	395	3.03	355	4.91	98	5.62	108
18.....	3.83	1,203	3.27	499	3.03	410	3.03	355	5.27	104	6.76	108
19.....	3.63	872	3.29	513	3.04	422	3.01	345	5.26	106	6.68	105
20.....	3.79	1,123	3.28	506	3.05	435	2.99	336	5.03	109	6.92	103
21.....	3.68	942	3.29	513	3.05	452	2.97	328	4.93	109	6.94	105
22.....	3.61	844	3.29	513	3.05	472	2.95	320	4.91	106	6.76	106
23.....	3.50	710	3.35	565	3.06	485	2.94	316	4.88	105	6.95	106
24.....	3.40	610	3.33	547	3.10	520	2.93	312	4.71	106	6.92	105
25.....	3.39	601	3.30	520	3.18	590	2.90	300	4.63	110	6.60	104
26.....	3.37	583	3.27	499	3.21	630	2.85	285	4.66	113	6.16	100
27.....	3.35	565	3.27	499	3.27	695	2.83	279	4.75	109	5.32	98
28.....	3.41	620	3.26	492	3.29	732	2.83	279	4.59	104	6.20	100
29.....	3.39	601	3.27	499	3.25	680	2.81	273	4.59	104	6.70	103
30.....	3.37	583	3.27	499	3.23	640	2.81	273	4.72	103	6.14	105
31.....	3.38	592	3.25	485	.....	.....	2.79	267	.....	.....	6.86	106

^b Ice conditions Nov. 11 to Dec. 31.

MONTHLY DISCHARGE of Rocky River near Hawes, for 1914.

(Drainage area 428 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	129	62	96	0.224	0.26	5,903
February.....	72	53	66	0.154	0.16	3,665
March.....	92	64	75	0.175	0.20	4,612
April.....	313	94	198	0.463	0.52	11,782
May.....	1,170	265	504	1.178	1.36	30,990
June.....	3,964	719	1,866	4.360	4.86	111,034
July.....	5,290	565	2,132	4.981	5.74	131,092
August.....	680	485	545	1.273	1.47	33,511
September.....	732	370	469	1.096	1.22	27,907
October.....	625	267	392	0.916	1.06	24,103
November.....	270	94	159	0.372	0.42	9,461
December.....	108	94	101	0.236	0.27	6,210
The year.....	17.54	400,270

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MCLEOD RIVER NEAR THORNTON.

Location.—On the NW. $\frac{1}{4}$ Sec. 3, Tp. 54, Rge. 16, W. of 5th Mer., at the Thornton ferry, about one mile downstream from the mouth of Wolf Creek, and about 200 feet south of E. Smith's ranch buildings.

Records available.—May 18, 1914, to December 31, 1914; discharge measurements available from September 26, 1913, to December 31, 1914.

Gauge.—Vertical staff, directly under the ferry cable, on the right bank of the river.

Bench-mark.—Spike driven in 4-inch tree on the right bank, about 200 feet downstream from gauge. Elevation 11.52 feet above zero of gauge.

Channel.—One channel at all stages, fairly permanent.

Discharge measurements.—Made from ferry cable and by wading.

Winter flow.—Stream affected by ice from November to April. Discharge measurements made at a point about 1,000 feet above regular station.

Observer.—Edward Smith.

DISCHARGE MEASUREMENTS of McLeod River near Thornton, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 2	P. H. Daniells	220	116	.36	.....a	42.0
Jan. 19	do	200	75	.24	.....a	18.3
Feb. 7	do	111	81	.21	.....a	17.0
Mar. 2	do	178	124	.43	.....a	54.0
Mar. 26	do	221	209	.56	.....a	117.0
May 18	do	298	781	2.10	2.70	1,640.0
June 3	do	270	525	1.68	1.80	884.0
June 9	do	374	2,555	8.03	10.80	20,500.0 ^b
June 19	do	337	1,258	2.91	4.24	3,668.0
July 12	do	322	1,056	2.54	3.50	2,685.0
July 20	do	290	689	1.75	2.31	1,210.0
Aug. 4	do	261	451	1.43	1.46	646.0
Aug. 15	do	262	437	1.40	1.40	611.0
Aug. 29	do	266	486	1.60	1.65	781.0
Sept. 17	do	260	505	1.50	1.70	755.0
Sept. 30	do	262	461	1.39	1.52	642.0
Oct. 15	do	258	418	1.34	1.38	558.0
Oct. 29	do	247	341	1.18	1.09	402.0
Nov. 18	do	240	294	0.73	1.43	215.0
Dec. 5	do	125	179	1.22	1.40	218.0
Dec. 30	do	120	138	0.72	1.12	100.0

a No gauge.

b Estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of McLeod River near Thornton, for 1914.

DAY.	May.		June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			1.60	720	5.00	5,220	1.60	720
2			1.70	790	4.80	4,770	1.50	660
3			1.80	860	4.50	4,170	1.50	660
4			2.40	1,360	4.20	3,640	1.40	600
5			2.30	1,270	4.00	3,320	1.40	600
6			2.30	1,270	4.00	3,320	1.40	600
7			7.00	10,400	3.90	3,170	1.30	540
8			8.00	13,080	3.80	3,020	1.30	540
9			10.80	20,584	3.60	2,730	1.40	600
10			9.80	17,904	3.50	2,590	1.40	600
11			9.00	15,760	3.50	2,590	1.50	660
12			8.30	13,884	3.60	2,730	1.50	660
13			7.70	12,276	3.30	2,320	1.40	600
14			7.10	10,668	3.40	2,450	1.40	600
15			6.50	9,060	3.10	2,080	1.40	600
16			5.90	7,460	3.00	1,970	1.30	540
17			5.30	5,930	2.70	1,640	1.30	540
18	2.70	1,640 ^a	4.70	4,560	2.60	1,540	1.20	480
19	2.50	1,450	4.30	3,810	2.40	1,360	1.20	480
20	2.40	1,360	4.40	3,990	2.30	1,270	1.20	480
21	2.70	1,640	4.40	3,990	2.20	1,180	1.20	480
22	2.70	1,640	5.30	5,930	2.20	1,180	1.20	480
23	2.60	1,540	6.60	9,328	2.10	1,090	1.30	540
24	2.60	1,540	6.30	8,524	2.00	1,010	1.50	660
25	2.70	1,640	6.10	7,988	2.00	1,010	1.70	790
26	2.70	1,640	5.90	7,460	1.90	930	2.00	1,010
27	2.30	1,270	5.70	6,940	1.80	860	1.80	860
28	2.10	1,090	5.50	6,420	1.80	860	1.70	790
29	2.00	1,010	5.30	5,930	1.80	860	1.60	720
30	1.80	860	5.10	5,450	1.70	790	1.50	660
31	1.70	790			1.70	790	1.40	600

^a Station established.

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DAILY GAUGE HEIGHT AND DISCHARGE of McLeod River near Thornton, for 1914.

DAY.	September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.40	600	1.50	660	1.10	430	1.40	280
2.....	1.40	600	1.50	660	1.10	430	1.50	292
3.....	1.30	540	1.50	660	1.00	390	1.50	250
4.....	1.30	540	1.60	720	1.00	390	1.40	235
5.....	1.20	480	1.60	720	1.10	430	1.40	220
6.....	1.20	480	1.60	720	1.10	430	1.40	236
7.....	1.20	480	1.60	720	1.00	390	1.40	250
8.....	1.30	540	1.50	660	1.10	430	1.40	256
9.....	1.40	600	1.50	660	1.20	480	1.40	250
10.....	2.50	1,450	1.50	660	1.30	540	1.30	235
11.....	2.40	1,360	1.50	660	1.40	600	1.30	220
12.....	2.10	1,090	1.50	660	1.20	480	1.30	200
13.....	2.00	1,010	1.40	600	1.10	430	1.30	200
14.....	1.80	860	1.40	600	1.20	440 ^b	1.20	220
15.....	1.80	860	1.40	600	1.20	290	1.20	225
16.....	1.80	860	1.40	600	1.00	270	1.10	225
17.....	1.70	790	1.30	540	1.20	208	1.10	233
18.....	1.70	790	1.30	540	1.40	211	1.10	245
19.....	1.70	790	1.30	540	1.40	240	1.00	220
20.....	1.60	720	1.30	540	1.40	260	1.00	180
21.....	1.60	720	1.20	480	1.40	292	0.90	183
22.....	1.60	720	1.20	480	1.40	323	0.90	190
23.....	1.50	660	1.10	430	1.40	320	1.00	136
24.....	1.50	660	1.10	430	1.50	315	1.00	100
25.....	1.50	660	1.10	430	1.50	336	1.00	75
26.....	1.40	600	1.20	480	1.50	342	1.00	95
27.....	1.40	600	1.20	480	1.50	305	1.10	122
28.....	1.50	660	1.20	480	1.50	286	1.10	123
29.....	1.50	660	1.10	430	1.50	309	1.10	112
30.....	1.50	660	1.10	430	1.40	300	1.10	100
31.....			1.10	430			1.10	120 ^b

^b Ice conditions Nov. 14 to Dec. 31.

MONTHLY DISCHARGE of McLeod River near Thornton, for 1914.

(Drainage area 2,507 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (18-31).....	1,640	790	1,365	0.544	0.28	37,903
June.....	20,584	720	7,453	2.973	3.32	443,487
July.....	5,220	790	2,144	0.855	0.99	131,828
August.....	1,010	480	624	0.249	0.29	38,368
September.....	1,150	480	709	0.283	0.32	42,188
October.....	720	430	571	0.228	0.25	35,109
November.....	600	208	363	0.145	0.16	21,600
December.....	280	75	193	0.077	0.09	11,867
The period.....					5.71	762,350

LOBSTICK RIVER NEAR ENTWISTLE.

Location.—On the NE. $\frac{1}{4}$ Sec. 30, Tp. 53, Rge. 7, W. of 5th Mer., about $2\frac{1}{2}$ miles northwest of the village of Entwistle.

Records available.—July 11, 1913, to December 31, 1914. Discharge measurements available from February 20, 1913.

Gauge.—Vertical staff; elevation of zero maintained at 96.17 feet during 1913, and 95.44 feet during 1914.

Bench-mark.—Spike driven in 6-inch spruce stump on right bank of the river, and about 20 feet south of the gauge; assumed elevation 100.00 feet.

Channel.—Fairly permanent.

Discharge measurements.—Made from bridge.

Winter flow.—River affected by ice from November to April, and discharge measurements are made at a point about 700 feet downstream from regular section.

Observer.—A. H. Young.

DISCHARGE MEASUREMENTS of Lobstick River near Entwistle, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Feb. 6	P. H. Daniells	30	28	1.00	.....^a	29
Mar. 25	do	26	33	1.63	.....^a	54
May 9	do	36	54	1.83	2.03	99
June 9	do	71	321	5.57	5.67	1,890 ^b
Oct. 30	do	38	48	2.30	2.09	111
Nov. 10	do	33	47	1.90	1.97	89
Nov. 27	do	25	88	1.08	3.11	92
Dec. 22	do	30	33	1.84	3.36	60

^a No gauge.

^b Estimate.

DAILY GAUGE HEIGHT AND DISCHARGE of Lobstick River near Entwistle, for 1914.

DAY.	May.		June.		July.		August.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1	.....	.....	1.80	60	^a	^a.....	.....	.....
2	.....	.....	1.76	56	.....	.....	.....	.....
3	.....	.....	1.76	56	.....	.....	.....	.....
4	.....	.....	2.18	126	.....	.....	.....	.....
5	.....	.....	2.56	218	.....	.....	.....	.....
6	.....	.....	3.23	452	.....	.....	.....	.....
7	.....	.....	4.13	886	.....	.....	.....	.....
8	.....	.....	4.90	1,350	.....	.....	.....	.....
9	2.03	96	5.67	1,888	.....	.....	.....	.....
10	1.98	87	^a.....	.....	.....	.....	.....	.....
11	1.93	80	.....	.....	.....	.....	.....	.....
12	1.93	80	.....	.....	.....	.....	.....	.....
13	1.96	84	.....	.....	.....	.....	.....	.....
14	1.90	75	.....	.....	.....	.....	.....	.....
15	1.80	60	.....	.....	.....	.....	.....	.....
16	1.98	87	.....	.....	.....	.....	.....	.....
17	1.88	72	.....	.....	.....	.....	.....	.....
18	1.93	80	.....	.....	.....	.....	.....	.....
19	1.92	78	.....	.....	.....	.....	.....	.....
20	2.04	98	.....	.....	.....	.....	.....	.....
21	2.03	96	.....	.....	.....	.....	.....	.....
22	1.98	87	.....	.....	.....	.....	.....	.....
23	2.01	92	.....	.....	.....	.....	.....	.....
24	2.03	96	.....	.....	.....	.....	.....	.....
25	2.03	96	.....	.....	.....	.....	.....	.....
26	2.03	96	.....	.....	.....	.....	.....	.....
27	2.02	94
28	1.88	72
29	2.13	116
30	1.96	84
31	1.88	72

^a No observer from June 10 to Sept. 21.

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DAILY GAUGE HEIGHT AND DISCHARGE of Lobstick River near Entwistle, for 1914.

DAY.	September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	a		2.06	102	2.05	100	2.54	78
2.....			2.06	102	2.03	96	2.51	76
3.....			2.06	102	2.01	92	2.41	74
4.....			2.11	112	2.01	92	2.41	73
5.....			2.11	112	2.01	92	2.41	71
6.....			2.16	122	2.00	90	2.45	69
7.....			2.16	122	2.01	92	2.46	69
8.....			2.14	118	1.96	84	2.58	69
9.....			2.10	110	1.93	80	2.68	70
10.....			2.06	102	1.96	89 ^b	2.71	68
11.....			2.07	104	1.81	88	2.66	62
12.....			2.01	92	1.81	84	2.38	54
13.....			2.03	96	1.76	80	2.31	56
14.....			2.06	102	1.71	81	2.26	59
15.....			2.09	108	1.81	68	2.22	60
16.....			2.09	108	1.80	68	2.09	61
17.....			2.10	110	2.71	66	2.31	63
18.....			2.11	112	2.71	64	2.11	65
19.....			2.11	112	2.74	76	2.06	65
20.....	a		2.10	110	2.76	80	2.04	58
21.....								
22.....	2.26	142	2.10	110	2.71	84	2.01	58
23.....	2.26	142	2.08	106	2.71	89	3.36	60
24.....	2.25	140	2.07	104	2.71	86	3.36	62
25.....	2.24	138	2.06	102	2.71	83	3.29	60
26.....	2.22	134	2.06	102	2.71	83	3.29	52
27.....	2.21	132	2.06	102	2.68	88	3.26	48
28.....	2.26	142	2.05	100	2.64	92	.....c	48
29.....	2.30	150	2.06	102	2.61	90	.....c	52
30.....	2.16	122	2.06	102	2.58	80	.....c	52
31.....	2.11	112	2.05	100	2.56	79	.....c	51
			2.05	100			.....c	52

a No observer from June 10 to Sept. 21.

b Ice conditions from Nov. 10 to Dec. 31.

c No gauge heights.

MONTHLY DISCHARGE of Lobstick River near Entwistle, for 1914.

(Drainage area 718 square miles)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (9-31).....	116	60	86	0.120	0.10	3,922
June (1-9).....	1,888	56	566	0.788	0.26	10,102
July.....						
August.....						
September (21-30).....	150	112	135	0.188	0.07	2,677
October.....	122	92	106	0.148	0.17	6,518
November.....	100	64	84	0.117	0.13	4,998
December.....	78	48	62	0.086	0.10	3,812
The period.....					0.83	32,029

PEMBINA RIVER NEAR ENTWISTLE.

Location.—On the SW. $\frac{1}{4}$ Sec. 20, Tp. 53, Rge. 7, W. 5th Mer., directly under the Grand Trunk Pacific Railway trestle, about $1\frac{1}{2}$ miles west of the Entwistle station.

Records available.—May 8, 1914, to December 31, 1914. Discharge measurements available from February 20, 1913.

Gauge.—Vertical staff, spiked to pile about 20 feet downstream from the cable and 20 feet from the right bank.

Bench-mark.—Spike driven in 12-inch square pile on the right bank, and about 4 feet west of the cable support; elevation 16.66 feet above zero of gauge.

Channel.—One channel at all stages, fairly permanent.

Discharge measurements.—Made from cable car.

Winter flow.—River affected by ice from November to April. Discharge measurements made at a point about 1,500 feet above regular station.

Observer.—Fred Williams.

DISCHARGE MEASUREMENTS of Pembina River near Entwistle, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 17.....	P. H. Daniells.....	70	44	0.54	1.25	24.0
Feb. 6.....	do.....	46	26	0.40	1.40	104.0
Feb. 27.....	do.....	97	44	0.31	1.70	13.6
Mar. 24.....	do.....	105	65	0.50	1.85	33.0
April 11.....	do.....	150	126	0.77	1.95	97.0
May 9.....	do.....	156	756	2.24	3.03	1,694.0
June 9.....	do.....	195	2,100	7.29	10.50	15,300.0 ^a
June 10.....	do.....	191	1,923	7.05	9.43	13,564.0
June 25.....	do.....	177	1,191	4.57	5.64	5,413.0
July 9.....	do.....	163	870	2.36	3.35	2,054.0
July 27.....	do.....	162	603	0.90	1.95	544.0
Aug. 31.....	do.....	134	480	0.57	1.29	275.0
Sept. 19.....	do.....	149	543	0.80	1.64	442.0
Oct. 16.....	do.....	147	485	0.58	1.32	279.0
Oct. 30.....	do.....	143	472	0.48	1.16	227.0
Nov. 10.....	do.....	108	137	0.94	0.80	127.0
Nov. 27.....	do.....	85	228	0.56	1.41	128.0
Dec. 22.....	do.....	83	176	0.25	0.92	44.0

^a Estimate.

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DAILY GAUGE HEIGHT AND DISCHARGE of Pembina River near Entwistle, for 1914.

DAY.	May.		June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.40	310	3.90	2,730	1.80	540
2.....			1.40	310	3.70	2,470	1.70	480
3.....			1.40	310	3.40	2,100	1.70	480
4.....			1.30	270	3.01	1,660	1.60	420
5.....			2.50	1,150	3.00	1,650	1.40	310
6.....			2.50	1,150	3.00	1,650	1.40	310
7.....			3.20	1,860	3.10	1,750	1.40	310
8.....	3.10	1,750 ^a	7.07	8,190	3.30	1,980	1.40	310
9.....	3.00	1,650	10.95	17,260	3.50	2,220	1.40	310
10.....	3.30	1,980	9.45	13,660	3.40	2,100	1.40	310
11.....	3.50	2,220	8.50	11,380	3.40	2,100	1.40	310
12.....	3.40	2,100	7.20	8,450	3.30	1,980	1.40	310
13.....	3.00	1,650	6.70	7,450	3.50	2,220	1.40	310
14.....	3.00	1,650	5.90	5,880	3.70	2,470	1.40	310
15.....	2.60	1,250	5.20	4,630	3.50	2,220	1.40	310
16.....	2.40	1,050	4.80	4,000	3.40	2,100	1.30	270
17.....	2.30	950	4.50	3,560	3.30	1,980	1.30	270
18.....	2.40	1,050	4.20	3,140	3.10	1,750	1.30	270
19.....	2.40	1,050	4.00	2,890	2.80	1,450	1.30	270
20.....	2.70	1,350	4.10	3,000	2.50	1,150	1.30	270
21.....	2.70	1,350	4.20	3,140	2.40	1,050	1.30	270
22.....	2.60	1,250	4.50	3,560	2.30	950	1.30	270
23.....	2.50	1,150	4.80	4,000	2.30	950	1.30	270
24.....	2.30	950	6.20	6,450	2.20	850	1.30	270
25.....	2.10	760	5.60	5,340	2.10	760	1.30	270
26.....	2.00	680	5.00	4,300	2.00	680	1.30	270
27.....	1.90	610	4.70	3,850	1.95	645	1.30	270
28.....	1.80	540	4.50	3,560	1.95	645	1.30	270
29.....	1.70	480	4.30	3,280	1.95	645	1.30	270
30.....	1.60	420	4.20	3,140	1.95	645	1.30	270
31.....	1.50	360			1.90	610	1.30	270

^a Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Pembina River near Entwistle, for 1914.

DAY.	September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.20	240	1.30	270	1.20	240	1.44	108
2.....	1.20	240	1.30	270	1.20	240	1.44	104
3.....	1.10	210	1.30	270	1.20	240	1.44	100
4.....	1.10	210	1.30	270	1.20	240	1.44	94
5.....	1.10	210	1.30	270	1.20	240	1.44	85
6.....	1.10	210	1.40	310	1.20	240	1.40	72
7.....	1.10	210	1.50	360	1.10	210	1.40	72
8.....	1.10	210	1.50	360	1.00	180	1.40	72
9.....	1.30	270	1.50	360	0.90	150	1.40	72
10.....	1.30	270	1.50	360	0.80	128 ^b	1.40	68
11.....	1.30	270	1.40	310	1.00	127	1.36	60
12.....	1.40	310	1.40	310	1.00	127	1.36	53
13.....	1.40	310	1.40	310	1.00	124	1.36	50
14.....	1.40	310	1.30	270	1.00	122	1.36	50
15.....	1.50	360	1.30	270	1.00	119	1.36	52
16.....	1.50	360	1.30	270	1.10	116	1.32	50
17.....	1.60	420	1.30	270	1.20	114	1.12	52
18.....	1.60	420	1.30	270	1.20	112	1.12	52
19.....	1.65	450	1.30	270	1.20	114	1.12	50
20.....	1.65	450	1.30	270	1.20	118	1.12	46
21.....	1.60	420	1.30	270	1.40	120	1.12	43
22.....	1.50	360	1.20	240	1.40	120	0.90	44
23.....	1.50	360	1.20	240	1.40	120	0.90	47
24.....	1.50	360	1.20	240	1.40	120	0.90	46
25.....	1.50	360	1.20	240	1.50	122	0.90	41
26.....	1.50	360	1.20	240	1.50	124	0.90	37
27.....	1.50	360	1.20	240	1.50	128	0.90	36
28.....	1.50	360	1.20	240	1.48	120	0.90	39
29.....	1.40	310	1.20	240	1.48	112	0.90	42
30.....	1.40	310	1.20	240	1.48	110	0.90	44
31.....			1.20	240			0.90	45 ^b

^b Ice conditions.

MONTHLY DISCHARGE of Pembina River near Entwistle, for 1914.

(Drainage area 1,858 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....						
May (8-31).....	2,220	360	1,177	0.633	0.56	56,016
June.....	17,260	270	4,348	2.340	2.61	258,722
July.....	2,730	610	1,554	0.836	0.96	95,554
August.....	540	270	311	0.167	0.19	19,123
September.....	450	210	317	0.171	0.19	18,863
October.....	360	240	277	0.149	0.17	17,032
November.....	240	110	150	0.081	0.09	8,926
December.....	108	36	59	0.032	0.04	3,628
The period.....					4.81	477,864

SESSIONAL PAPER No. 25c

ATHABASKA RIVER AT ATHABASKA.

Location.—On the SE. $\frac{1}{4}$ Sec. 20, Tp. 66, Rge. 22, W. 4th Mer., 400 feet below the ferry cable in the town of Athabaska.

Records available.—March 17, 1914, to December 31, 1914. Discharge measurements only during the winters of 1912-13 and 1913-14.

Drainage area.—29,200 square miles; taken from small scale map and is liable to be in error.

Gauge.—Inclined staff, reading to feet and tenths, located on left bank of river, 300 feet above ferry cable and 100 feet below measuring section. Zero elevation of gauge maintained at 1,635.38 feet since established.

Bench-mark.—On a track spike in a telegraph pole on right bank of river; pole located at foot of Stratheona Street north side of C.N.R. track, and opposite Hudson Bay Co. office; elevation 1,660.60 feet. (Canadian Northern Railway datum.)

Channel.—One slightly shifting channel at all stages.

Discharge measurements.—Made from a boat run on a cable.

Winter flow.—From November to April the river is frozen over, and measurements are made at the regular section.

Observer.—L. J. Cole.

DISCHARGE MEASUREMENTS of Athabaska River at Athabaska, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 13.	P. H. Daniells.	685	2,587	1.31	2.93	3,401
Feb. 3.	do.	650	2,466	1.16	2.90	2,857
Feb. 24.	do.	645	2,186	1.21	3.06	2,636
Mar. 18.	do.	650	2,400	1.31	3.56	3,158
April 3.	do.	650	2,522	1.28	3.65	3,219
May 12.	G. J. Smith and J. M. Paul.	690	4,636	2.59	4.18	12,020
May 30.	J. M. Paul.	714	5,586	3.14	5.45	17,532
June 23.	do.	783	11,130	5.55	12.89	61,772
July 9.	do.	795	10,190	5.19	11.45	52,855
Aug. 5.	do.	771	6,970	3.37	6.82	22,809
Aug. 21.	do.	760	5,932	3.04	5.90	18,064
Sept. 4.	do.	719	5,161	2.86	5.20	14,748
Sept. 23.	do.	716	5,091	2.75	5.07	14,164
Oct. 15.	do.	704	4,998	2.50	4.72	12,473
Nov. 6.	P. H. Daniells.	682	4,138	2.04	3.19	8,449
Dec. 15.	do.	680	3,508	0.90	3.60	3,146

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Athabaska, for 1914.

DAY.	March.		April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.65	3,175	4.20 ^b	12,100	4.55	13,500	11.92	55,656
2.....			3.60	3,175	4.10 ^b	11,750	4.23	12,220	11.55	53,140
3.....			3.65	3,220	4.08	11,680	3.98	11,340	11.20	50,760
4.....			3.65	3,220	3.98	11,340	4.00	11,400	11.00	49,400
5.....			3.70	3,250	3.95	11,250	4.72	14,180	10.98	49,264
6.....			3.75	3,300	3.92	11,160	6.05	20,575	11.02	49,536
7.....			3.75	3,300	4.00	11,400	8.60	35,900	11.15	50,420
8.....			3.75	3,300	4.08	11,680	9.58	42,560	11.35	51,780
9.....			3.80	3,300	4.08	11,680	15.10	81,200	11.40	52,120
10.....			3.80	3,325	4.10	11,750	19.02	108,640	11.00	49,400
11.....			3.85	3,360	4.12	11,820	18.97	106,300	10.52	46,136
12.....			3.90	3,400	4.12	11,820	16.82	91,500	10.30	44,640
13.....			4.05	3,450	4.25	12,300	15.25	80,300	10.18	43,824
14.....			4.30	3,450	4.37	12,780	14.27	73,350	10.35	44,980
15.....			4.40	3,400	4.43	13,020	13.84	70,000	10.90	48,720
16.....			4.70	3,380	4.45	13,100	12.57	60,950	10.92	48,856
17.....	3.55	3,170 ^a	5.05	3,380	4.50	13,300	12.09	57,300	10.75	47,700
18.....	3.60	3,150	5.40	3,380	4.48	13,220	12.04	56,472	10.52	46,136
19.....	3.60	3,150	5.50	3,380	4.62	13,780	12.24	57,832	10.12	43,416
20.....	3.65	3,175	5.70	3,370	4.78	14,420	12.22	57,696	9.40	38,700
21.....	3.67 ^b	3,200	5.80 ^b	3,350	4.85	14,725	12.22	57,696	8.80	34,800
22.....	3.70	3,200	6.00 ^b	3,400	4.75	14,300	12.20	57,560	8.45	32,525
23.....	3.70	3,200	6.20 ^b	3,500	4.65	13,900	12.75	61,300	8.52	32,980
24.....	3.70	3,200	5.90 ^b	5,400	4.45	13,100	12.92	62,456	8.65	33,825
25.....	3.70	3,175	5.60 ^b	6,100	4.32	12,580	14.22	71,296	8.00	29,800
26.....	3.65	3,150	5.20 ^b	7,550	4.55	13,500	14.60	73,880	7.60	27,400
27.....	3.60	3,150	5.00 ^b	8,550	4.82	14,590	13.30	65,040	7.32	25,720
28.....	3.60	3,150	4.60 ^b	9,600	5.35	16,975	12.50	59,600	7.22	25,120
29.....	3.65	3,150	4.30 ^b	10,880 ^a	5.65	18,450	12.18	57,424	7.18	24,880
30.....	3.65	3,200	4.25 ^b	12,300	5.40	17,200	12.15	57,220	7.12	24,520
31.....	3.70	3,200			4.92	15,040			6.95	23,325

^a Ice conditions March 17 to April 29; discharge estimated.^b Gauge height interpolated.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Athabaska River at Athabaska, for 1914.

DAY.	August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	6.95	23,525	5.60	16,400	4.88	13,320	3.35	8,600	5.01	4,000
2.....	6.72	22,260	5.52	16,040	5.38	15,410	3.35	8,600	4.70	3,820
3.....	6.55	21,325	5.40	15,500	5.35	15,275	3.35	8,600	4.60	3,880
4.....	6.62	21,710	5.22	14,600	5.48	15,860	3.40	8,700	4.20	3,600
5.....	6.82	22,810	5.12	14,280	5.68	16,800	3.30	8,500	4.35	3,790
6.....	6.88	23,140	4.88	13,320	5.70	16,900	3.23	8,360	4.25	3,700
7.....	6.90	23,250	4.82	13,080	5.60	16,400	3.20	8,300	4.25	3,700
8.....	6.95	23,525	4.95	13,600	5.50	15,950	3.18	8,260	4.05	3,450
9.....	6.80	22,700	5.12	14,280	5.38	15,410	3.10	8,100	3.80	3,200
10.....	6.65	21,875	5.08	14,120	5.20	14,600	3.06	8,020	3.80	3,200
11.....	6.68	22,040	5.14	14,360	5.02	13,880	2.98	7,860a	3.65	2,900
12.....	6.55	21,325	5.00	16,400	4.92	13,480	2.96	7,000	3.75	2,930
13.....	6.10	18,900	5.88	17,800	4.88	13,320	2.88	6,050	3.60	2,960
14.....	5.87	17,750	5.32	15,140	4.78	12,930	2.88	5,100	3.50	3,000
15.....	5.62	16,500	4.90	13,400	4.68	12,580	2.88	4,200	3.60	3,150
16.....	5.68	16,800	4.70	12,650	4.62	12,370	2.00	3,000	3.60	3,200
17.....	5.62	16,500	4.50	11,950	4.52	12,020	1.88	3,600	3.45	3,200
18.....	5.72	17,000	4.38	11,530	4.40	11,600	2.13	3,600	3.50	3,140
19.....	5.90	17,900	4.68	12,580	4.35	11,425	4.32	4,000	3.45	3,050
20.....	5.95	18,150	4.98	13,720	4.35	11,425	5.00	4,310	3.45	3,000
21.....	5.80	17,400	5.08	14,120	4.25	11,075	5.10	4,400	3.45	3,100
22.....	5.80	17,400	5.10	14,200	4.25	11,075	4.63	4,220	3.47	3,000
23.....	5.82	17,500	5.02	13,880	4.25	11,075	4.58	4,200	3.48	3,000
24.....	5.85	17,650	5.00	13,800	4.15	10,750	4.18	4,000	3.49	2,900
25.....	5.98	18,300	4.90	13,400	3.98	10,240	5.50	4,400	3.50	2,800
26.....	6.10	18,900	4.70	12,650	3.75	9,575	5.30	4,380	3.51	2,700
27.....	6.00	18,400	4.55	12,125	3.60	9,200	5.10	4,100	3.52	2,700
28.....	5.70	16,900	4.45	11,775	3.60	9,200	5.10	4,000	3.53	2,800
29.....	5.58	16,310	4.50	11,950	3.52	9,000	5.05	4,000	3.54	2,900
30.....	5.52	16,040	4.58	12,230	3.48	8,900	4.95	4,000	3.55	2,900
31.....	5.58	16,310	.....	.....	3.40	8,700	.....	.....	3.56	3,200a

a Ice conditions Nov. 11 to Dec. 31.

MONTHLY DISCHARGE of Athabaska River at Athabaska, for 1914.

(Drainage area 29,200 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	3,500	2,900	3,200	0.110	0.13	196,760
February.....	3,150	2,630	2,902	0.099	0.10	161,168
March.....	3,300	3,000	3,161	0.108	0.12	194,362
April.....	12,300	3,175	4,615	0.158	0.18	274,610
May.....	18,450	11,160	13,216	0.453	0.52	812,592
June.....	108,640	11,340	56,223	1.925	2.15	3,345,480
July.....	55,656	23,525	41,280	1.414	1.63	2,538,180
August.....	23,525	16,040	19,358	0.663	0.76	1,190,296
September.....	17,800	11,530	13,832	0.474	0.53	823,088
October.....	16,900	8,700	12,572	0.431	0.50	772,092
November.....	8,700	3,600	5,845	0.200	0.22	347,800
December.....	4,000	2,700	3,183	0.109	0.13	195,716
The year.....	.....	.....	.....	.....	6.97	10,853,044

NOTE.—Discharges for Jan., Feb. and March estimated, as no gauge heights were obtained until March. 17

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Athabaska River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Jan. 3	P. H. Daniells	Athabaska River	NW. 5-51-25-5.	620.0	1,374.0	0.65	900.0
Feb. 9	do	do	do	198.0	1,009.0	0.99	998.0
Mar. 27	do	do	do	200.0	930.0	0.95	888.0
June 3	do	Edson River	NW. 5-51-16-5.	43.0	70.0	0.48	34.0
July 20	do	do	do	43.0	96.0	1.11	107.0
Aug. 4	do	do	do	46.0	72.0	0.43	31.0
Oct. 15	do	do	do	44.0	75.0	0.47	35.0
Jan. 20	do	Embarras River	SW. 5-52-18-5.	53.0	30.0	0.12	3.7
April 14	do	do	do	260.0	230.0	1.14	262.0
May 16	do	do	do	135.0	211.0	1.81	381.0
June 2	do	do	do	92.0	170.0	0.68	116.0
July 21	do	do	do	125.0	252.0	1.06	267.0
Aug. 18	do	do	do	95.0	162.0	0.84	135.0
Sept. 18	do	do	do	107.0	178.0	0.82	146.0
Oct. 28	do	do	do	94.0	144.0	0.55	80.0
Dec. 4	do	do	do	105.0	130.0	0.53	67.0
Feb. 28	do	do	NW. 6-51-19-5.	48.0	53.0	0.15	7.8
Jan. 4	do	Fiddle Creek	SE. 15-49-27-5.	13.0	7.6	0.92	7.1
Feb. 10	do	do	do	18.5	6.7	0.98	6.6
Mar. 29	do	do	do	15.0	5.0	0.97	4.6
May 30	do	do	do	52.0	34.0	2.09	70.0
July 4	do	do	SE. 15-49-27-5.	116.0	96.0	3.28	313.0
Aug. 14	do	do	do	51.0	32.0	1.58	51.0
Sept. 15	do	do	do	55.0	34.0	1.90	64.0
Sept. 29	do	do	do	62.0	44.0	2.48	105.0
Oct. 26	do	do	do	45.0	27.0	1.52	41.0
Nov. 17	do	do	do	31.0	22.0	0.84	18.1
Dec. 3	do	do	do	22.0	11.1	0.57	6.3
Dec. 29	do	do	do	26.0	12.2	0.75	9.2
Oct. 9	J. M. Paul	Lesser Slave River	22-71-1-5	217.0	980.0	4.42	4,342.0
Sept. 8	do	do	do	212.0	922.0	3.15	2,905.0
Oct. 10	do	do	6-73-5-5	194.0	1,346.0	1.70	2,285.0
May 12	P. H. Daniells	Maligne River	Above Canyon	24.0	19.5	1.05	20.0
May 27	do	do	do	41.0	36.0	1.58	57.0
June 15	do	do	do	32.0	57.0	3.47	199.0
June 29	do	do	do	30.0	51.0	5.49	281.0
July 16	do	do	do	35.0	67.0	5.65	377.0
Aug. 13	do	do	do	24.0	33.0	2.11	70.0
Aug. 25	do	do	do	24.0	29.0	1.95	57.0
Sept. 11	do	do	do	24.0	26.0	1.78	45.0
Sept. 25	do	do	do	25.0	21.0	0.95	20.0
Oct. 8	do	do	do	24.0	24.0	1.05	25.0
Oct. 24	do	do	do	23.0	21.0	1.00	21.0
Jan. 20	do	McLeod River	NW. 5-52-18-5.	32.0	24.0	0.20	4.8
July 13	do	Prairie Creek	NE. 5-51-25-5.	24.0	28.0	1.50	43.0
Jan. 27	do	Snaring River	NW. 33-46-1-6.	67.0	91.0	0.47	43.0
Mar. 7	do	do	do	35.0	14.0	1.32	18.5
April 18	do	do	do	45.0	65.0	0.70	46.0
May 13	do	do	do	226.0	232.0	3.51	812.0
May 28	do	do	do	141.0	205.0	3.63	747.0
June 13	do	do	do	190.0	381.0	5.95	2,268.0
June 30	do	do	do	214.0	416.0	5.56	2,319.0
July 15	do	do	do	199.0	408.0	5.65	2,307.0
July 29	do	do	do	136.0	230.0	4.42	1,018.0
Aug. 12	do	do	do	236.0	286.0	2.46	707.0
Aug. 27	do	do	do	236.0	261.0	2.29	597.0
Sept. 10	do	do	do	101.0	117.0	2.88	338.0
Sept. 26	do	do	do	257.0	290.0	3.07	918.0
Oct. 13	do	do	do	92.0	102.0	2.91	296.0
Oct. 23	do	do	do	67.0	98.0	1.91	187.0
Dec. 1	do	do	do	60.0	114.0	0.72	83.0
Mar. 28	do	Spring	SW. 2-51-26-5.	55.0	144.0	1.28	185.0
Jan. 5	do	Stony River	SE. 35-46-1-6.	42.0	91.0	2.01	187.0
Jan. 21	do	do	do	64.0	64.0	2.07	133.0
Feb. 11	do	do	do	82.0	100.0	1.71	171.0
Mar. 3	do	do	do	82.0	107.0	1.62	174.0
Mar. 30	do	do	do	97.0	439.0	2.53	1,112.0
May 29	do	do	do	53.0	87.0	1.49	128.0
Dec. 28	do	do	do	26.0	28.0	0.80	22.0
June 1	do	Sundance Creek	NW. 3-53-18-5.	27.0	41.0	3.07	126.0
July 10	do	do	do	23.0	26.0	1.11	31.0
Aug. 17	do	do	do	21.0	23.0	1.68	39.0
Sept. 16	do	do	do	27.0	28.0	1.18	33.0
Oct. 14	do	do	do	55.0	60.0	3.16	188.0
Oct. 20	do	Wolf Creek	SW. 3-54-16-5.	38.0	34.0	1.35	56.0
July 20	do	do	do				
Sept. 22	do	do	do				

NORTH SASKATCHEWAN RIVER DRAINAGE BASIN.

General Description.

The North Saskatchewan River draws its principal water supply from the eastern slope of the Rocky Mountains. The basin is bounded on the south by those of the Red Deer and South Saskatchewan Rivers, and on the north by those of the Athabaska and Churchill Rivers. The general trend of the stream from its source to where it joins the South Saskatchewan, a few miles below the city of Prince Albert, and forms the Saskatchewan River, is easterly.

The basin of the river easily divides itself into five parts or divisions, each of which requires a separate description for a clear understanding of the conditions of run-off.

The first, or upper section, consists of the eastern slope of the Rocky Mountains. While this part of the basin is not the greatest in area, it supplies the greater part of the run-off. In glaciers, and the perpetual snows of the higher peaks, innumerable small streams rise which form the main stream and its larger tributaries. These streams have well defined rocky valleys and considerable fall. The upper regions of this section are not well wooded, and allow a rapid run-off of melting snow and rain.

East of this first section is a division consisting of the foothills, which are, for the most part, well covered with forest and vegetable growth, forming probably the largest in area of the five sections. Here also is a very large source of supply for the stream, but due to its cover, a more regulated supply than in the first section. In this section the main stream is joined by the Clearwater and Brazeau Rivers, two of the most important tributaries of the whole basin. The streams in this section flow through deep valleys with fairly permanent beds and medium slopes.

From a little west of the city of Edmonton to the mouth of the Vermilion River the country is of a park-like nature, with large stretches of prairie. This section is small in area and has not a very large run-off. The principal tributaries are the Sturgeon and Vermilion Rivers, the first of which drains in from the wooded country of the north, the latter from the prairie sections of the south. The main stream is in a well defined valley with large flats along its course and a more or less permanent bed with a small slope.

Below the third section to a little above the city of Prince Albert is a division which has little drainage into the river. It consists of prairie uplands for the most part, with small patches of timber to the north. The stream widens out into shallow reaches, full of shifting sand bars, and has very little slope. The valley, while still well defined, is also much wider. In this section the main stream is fed by the Battle River, which has its source at the outlet of Battle Lake, and flows eastward through park land and prairie sections south of the main river, until it empties into the latter at the town of Battleford.

The east division is one in which the river, with a greater slope and more permanent bed, narrows considerably, as does also the valley. The run-off in this division is mostly from the north, which consists of well-wooded country drained by a number of small streams.

During 1913, stations were established on the Sturgeon River at St. Albert and Fort Saskatchewan, and on the Battle River at Ponoka. Cables were erected on the main river and the Clearwater River near Rocky Mountain House in 1913, records being obtained at these points during 1914.

A description of flood conditions in this basin may be found on page 30 and 31 in the Report of the Progress of Stream Measurements for 1912.

CLEARWATER RIVER NEAR ROCKY MOUNTAIN HOUSE.

Location.—On the SE. $\frac{1}{4}$ Sec. 16, Tp. 39, Rge. 7, W. 5th Mer., on G. Fletcher's farm, three miles southwest of Rocky Mountain House.

Records available.—January 1, 1914, to December 31, 1914.

Gauge.—Chain, located on left bank of river 10 feet below cable, and graduated to feet and tenths; length of chain from bottom of weight to marker is 15.28 feet. Zero elevation of gauge maintained at 3,105.04 feet since established.

Bench-mark.—On nails in poplar stump directly in front of cable tower on right bank; elevation 3,120.00 feet above mean sea level. (Department of Public Works of Canada datum.)

Channel.—One permanent channel at low water and probably two in high stages.

Discharge measurements.—Made from cable car.

Winter flow.—From November to April river is frozen over, and measurements are made at the cable section.

Observer.—G. Fletcher.

DISCHARGE MEASUREMENTS of Clearwater River near Rocky Mountain House, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 3.	J. S. Tempest	133	295	0.44	2.82	129
Mar. 7.	do	128	437	0.59	3.65	256
April 25.	do	182	510	0.85	1.89	435
May 19.	G. J. Smith and J. M. Paul	190	627	1.43	2.48	898
June 9.	J. M. Paul	197	864	2.62	3.79	2,261
June 24.	Dept. of Public Works, Canada	192	694	1.74	2.80	1,204
June 29.	J. M. Paul	193	744	1.86	3.00	1,385
July 20.	do	190	696	1.58	2.69	1,102
Aug. 8.	Dept. of Public Works, Canada	190	626	1.46	2.50	912
Aug. 12.	J. M. Paul	186	622	1.28	2.30	798
Aug. 27.	do	184	592	1.11	2.13	657
Sept. 14.	do	186	605	1.19	2.20	718
Sept. 29.	do	183	557	1.07	2.10	595
Oct. 10.	Dept. of Public Works, Canada	189	607	1.40	2.41	853
Oct. 20.	J. M. Paul	185	550	1.07	2.10	589
Nov. 5.	H. S. Kerby	180	473	0.88	1.80	417
Dec. 3.	R. J. McGuinness	180	410	0.62	2.14	256
Dec. 19.	do	163	344	0.46	2.18	158

DAILY GAUGE HEIGHT AND DISCHARGE of Clearwater River near Rocky Mountain House, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	2.72	128 ^a	3.59	205	3.49	234	3.55	240	1.79	388	1.75	360
2.	2.72	128	3.60	210	3.41	220	3.55	240	1.69	324	1.74	354
3.	2.71	129	3.57	193	3.41	220	3.55	240	1.71	336	1.88	451
4.	3.15	164	3.46	175	3.51	235	3.65	260	2.39	842	2.35	810
5.	3.30	198	3.36	160	3.61	246	3.70	270	2.29	762	2.51	944
6.	3.69	230	3.45	190	3.71	260	4.00	300	2.19	682	2.92	1,313
7.	3.78	235	3.39	175	3.67	256	4.00	300	2.14	642	2.98	1,367
8.	3.77	235	3.34	160	3.67	257	3.95	290	2.04	563	3.80	2,290
9.	3.82	240	3.47	200	3.60	247	3.93	290	2.34	802	3.65	2,095
10.	3.81	240	3.43	190	3.55	240	4.00	300	2.69	1,106	3.01	1,395
11.	3.51	203	3.42	190	3.50	230	4.10	310	2.79	1,196	3.00	1,385
12.	3.37	180	3.51	207	3.70	260	4.20	320	2.64	1,061	3.00	1,385
13.	3.69	215	3.51	207	3.70	260	4.20	320	2.61	1,034	3.00	1,385
14.	3.60	202	3.55	216	3.83	265	4.20	320	2.30	770	3.00	1,385
15.	3.68	215	3.55	216	3.70	260	4.10	300	2.29	762	3.00	1,385
16.	3.63	210	3.49	210	3.60	240	4.10	300 ^a	2.29	762	3.03	1,415
17.	3.62	210	3.48	210	3.70	260	4.10	310 ^b	2.34	802	3.06	1,445
18.	3.56	200	3.48	210	3.60	240	4.00	330	2.44	882	3.40	1,805
19.	3.56	200	3.42	200	3.60	240	3.80	350	2.48	917	3.50	1,915
20.	3.55	200	3.27	180	3.60	240	3.80	370	2.47	908	3.50	1,915
21.	3.45	180	3.06	160	3.50	220	3.60	400	2.46	899	3.60	2,035
22.	3.44	180	3.10	165	3.60	237	2.60	420	2.40	850	3.50	1,915
23.	3.33	160	3.35	200	3.75	270	2.10	440	2.24	722	3.00	1,385
24.	3.33	160	3.34	200	3.70	260	2.10	450 ^b	2.23	714	2.79	1,196
25.	3.32	160	3.44	215	3.55	230	1.89	458	2.22	706	2.80	1,205
26.	3.42	180	3.48	225	3.10	170	1.84	423	2.21	698	2.80	1,205
27.	3.31	162	3.47	225	3.00	150	1.84	423	2.25	730	3.00	1,385
28.	3.25	150	3.47	225	3.00	150	1.79	388	2.24	722	3.00	1,385
29.	3.60	200			3.10	167	1.79	388	2.08	594	3.00	1,385
30.	3.59	200			3.20	185	1.79	388	1.97	514	3.00	1,385
31.	3.59	200			3.50	230			1.86	437		

^a Ice conditions Jan. 1 to April 16.

^b Ice breaking up April 17 to April 24; discharges during this period interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Clearwater River near Rocky Mountain House, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	3.08	1,465	2.45	890	2.17	666	2.05	570	1.80	395	2.10	269
2.....	3.06	1,445	2.50	935	2.10	610	2.00	535	1.85	430	2.00	262
3.....	3.02	1,405	2.45	890	2.05	570	2.00	535	1.85	430	2.00	256
4.....	3.15	1,535	2.40	850	2.02	549	2.00	535	1.85	430	2.00	256
5.....	3.50	1,915	2.45	890	2.05	570	2.10	610	1.80	395	2.00	256
6.....	3.50	1,915	2.50	935	2.05	570	2.05	570	1.82	409	2.00	256
7.....	3.50	1,915	2.60	1,025	2.12	626	2.00	535	1.82	409	2.00	240
8.....	3.42	1,827	2.60	1,025	2.22	706	2.00	535	1.90	465	1.90	185
9.....	3.25	1,640	2.50	935	2.32	786	2.15	650	1.95	500	1.90	185
10.....	3.20	1,585	2.45	890	2.22	706	2.40	850	2.00	535	1.90	188
11.....	3.20	1,585	2.40	850	2.28	754	2.40	850	2.00	535	2.00	204
12.....	3.20	1,585	2.30	770	2.38	834	2.32	786	2.00	535	1.90	192
13.....	3.20	1,585	2.25	730	2.38	834	2.25	730	2.10	515b	1.80	150
14.....	3.30	1,695	2.20	690	2.18	674	2.20	690	2.18	502	1.80	146
15.....	3.45	1,860	2.28	754	2.10	610	2.20	690	2.30	480b	1.80	143
16.....	3.30	1,695	2.30	770	2.10	610	2.20	690	2.65	455a	1.70	131
17.....	3.20	1,585	2.28	754	2.05	570	2.20	690	2.70	438	1.70	125
18.....	3.20	1,585	2.30	770	2.00	535	2.15	650	2.90	428	1.90	138
19.....	3.00	1,385	2.30	770	2.00	535	2.15	650	3.05	425	2.08	158
20.....	2.72	1,133	2.22	706	2.06	578	2.10	610	3.02	424	2.08	178
21.....	3.00	1,385	2.20	690	2.10	610	2.10	610	3.00	422	2.08	180
22.....	2.88	1,277	2.20	690	2.05	570	2.10	610	2.75	418	2.08	182
23.....	2.75	1,160	2.28	754	2.00	535	2.10	610	2.60	409	2.08	182
24.....	2.65	1,070	2.25	730	2.00	535	2.05	570	2.60	393	2.08	182
25.....	2.50	935	2.25	730	1.95	500	2.00	535	2.60	369	2.09	182
26.....	2.62	1,043	2.20	690	1.90	465	2.00	535	2.60	358	2.09	180
27.....	2.50	935	2.10	610	1.90	465	1.95	500	2.40	352	1.99	165
28.....	2.45	890	2.11	618	1.98	521	1.95	500	2.30	342	1.99	136
29.....	2.42	866	2.12	626	2.10	610	1.90	465	2.30	317	2.09	135
30.....	2.40	850	2.10	610	2.10	610	1.80	395	2.30	280	2.09	140
31.....	2.38	834	2.20	690	.....	.....	1.80	395	.....	.....	2.10	155a

a Ice conditions Nov. 16 to Dec. 31.

b Ice forming Nov. 13 to Nov. 15; discharges during this period interpolated.

MONTHLY DISCHARGE of Clearwater River near Rocky Mountain House, for 1914.

(Drainage area 850 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	240	128	190	0.224	0.26	11,683
February.....	225	160	197	0.232	0.24	10,941
March.....	270	150	232	0.273	0.31	14,265
April.....	458	240	449	0.528	0.59	26,717
May.....	1,196	324	746	0.878	1.01	45,870
June.....	2,280	354	1,376	1.620	1.81	81,880
July.....	1,915	834	1,406	1.650	1.90	86,453
August.....	1,025	610	783	0.921	1.06	48,145
September.....	834	465	610	0.718	0.80	36,298
October.....	850	395	603	0.709	0.82	37,077
November.....	535	280	426	0.501	0.56	25,349
December.....	269	125	185	0.218	0.25	11,375
The year.....	.....	.....	.....	.....	9.61	436,053

NORTH SASKATCHEWAN RIVER NEAR ROCKY MOUNTAIN HOUSE.

Location.—On the NE. $\frac{1}{4}$ Sec. 21, Tp. 39, Rge. 7, W. 5th Mer., one-quarter of a mile below the railway bridge and one mile west of Rocky Mountain House.

Records available.—June 2, 1913, to December 31, 1914.

Gauge.—Inclined staff, graduated to feet and tenths, located on left bank of river 600 feet above cable. Zero elevation from June 2 to October 23, 1913, maintained at 3,108.39 feet. Zero elevation maintained at 3,108.42 feet since October 23, 1913.

Bench-mark.—Stump on left bank at ferry cable; elevation 3127.74 feet above mean sea level. (Department of Public Works of Canada datum.)

Channel.—One permanent channel at all stages.

Discharge measurements.—Made from cable located about 600 feet below the gauge.

Winter flow.—From November to April river is frozen over, and measurements are made at the cable section.

DISCHARGE MEASUREMENTS of North Saskatchewan River near Rocky Mountain House, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 5.....	J. S. Tempest.....	320	809	1.10	5.70	886
Mar. 8.....	do.....	330	444	1.82	5.65	806
April 27.....	do.....	421	749	2.28	4.01	1,709
May 18.....	G. J. Smith and J. M. Paul...	434	1,277	3.82	5.74	4,878
June 6.....	J. M. Paul.....	441	1,954	5.22	7.35	10,206
June 25.....	Dept. of Public Works, Canada	437	1,584	4.50	6.45	7,135
June 29.....	J. M. Paul.....	444	2,035	5.10	7.48	10,387
July 21.....	do.....	465	2,486	5.66	8.51	14,070
Aug. 7.....	Dept. of Public Works, Canada	441	2,001	5.41	7.58	10,812
Aug. 11.....	J. M. Paul.....	438	1,634	4.20	6.50	6,864
Aug. 28.....	do.....	439	1,788	4.40	6.82	7,876
Sept. 14.....	do.....	434	1,279	3.28	5.45	4,193
Sept. 28.....	do.....	434	1,328	3.60	5.73	4,784
Oct. 9.....	Dept. of Public Works, Canada	433	1,240	3.86	5.61	4,788
Oct. 19.....	J. M. Paul.....	431	1,046	3.00	5.04	3,137
Nov. 6.....	H. S. Kerby.....	415	720	2.40	4.41	1,728
Dec. 2.....	R. J. McGuinness.....	410	915	0.96	5.98	878
Dec. 20.....	do.....	417	720	1.17	6.32	843

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DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	5.7	885 ^a	5.4	740	5.7	810	5.60	920	4.17	1,894	5.55	4,350
2.....	5.7	885	5.3	720	5.7	825	5.60	930	4.50	2,350	6.35	6,440
3.....	5.6	870	5.3	720	5.7	840	5.70	936	4.90	3,000	7.20	9,150
4.....	5.7	885	5.3	720	5.8	820	5.70	944	5.30	3,800	8.15	12,680
5.....	5.7	885	5.3	714	5.7	840	5.80	950	5.12	3,410	7.95	11,920
6.....	5.8	900	5.3	707	5.5	830	5.80	925	5.07	3,310	7.70	10,970
7.....	5.9	920	5.1	700	5.6	818	5.90	900	4.65	2,570	9.55	18,000
8.....	5.8	920	5.1	680	5.6	806	5.70	900	4.67	2,602	8.15	12,680
9.....	5.6	880	5.1	660	5.7	800	5.80	910	5.20	3,580	7.40	9,870
10.....	5.4	840	5.0	655	5.7	816	5.80	920	5.40	4,020	7.15	8,980
11.....	5.6	860	5.0	650	5.6	830	5.90	950	5.70	4,690	7.05	8,640
12.....	5.4	840	5.0	650	5.6	820	5.80	920	5.55	4,350	7.30	9,510
13.....	5.7	870	5.2	708	5.7	840	5.80	920	5.77	4,862	7.40	9,870
14.....	6.0	900	5.2	760	5.8	860	5.80	920	5.50	4,240	7.75	11,160
15.....	6.2	910	5.3	790	5.8	840	5.80	930	5.65	4,570	8.15	12,680
16.....	6.3	910	5.3	790	5.7	857	5.80	930	6.00	5,460	8.80	15,150
17.....	6.2	900	5.4	740	5.7	870	5.80	930	5.90	5,200	9.05	16,100
18.....	6.1	880	5.4	700	5.7	870	5.90	940	5.75	4,810	9.05	16,100
19.....	6.1	860	5.2	730	5.7	896	5.90	950	5.75	4,810	8.80	15,150
20.....	6.0	860	5.3	650	5.7	920	5.90	960 ^a	5.60	4,460	8.30	13,250
21.....	6.0	860	5.3	650	5.7	930	5.80	1,060 ^b	5.50	4,240	7.55	10,410
22.....	6.0	837	5.3	730	5.7	940	5.80	1,170	5.45	4,130	7.30	9,510
23.....	5.9	815	5.4	785	5.7	940	7.80	1,280	5.55	4,350	7.00	8,470
24.....	5.6	800	5.5	830	5.6	920	5.50	1,390	6.00	5,460	6.70	7,490
25.....	5.6	800	5.5	820	5.5	900	5.20	1,500 ^b	6.30	6,300	6.57	7,074
26.....	5.5	800	5.6	810	5.5	900	4.00	1,690	6.05	5,600	7.15	8,980
27.....	5.5	780	5.6	810	5.3	870	4.00	1,690	5.75	4,816	7.50	9,510
28.....	5.3	755	5.7	790	5.2	850	3.95	1,630	5.40	4,020	7.25	9,330
29.....	5.3	720	.....	.....	5.4	870	4.00	1,690	5.25	3,690	7.45	10,050
30.....	5.4	720	.....	.....	5.5	890	4.05	1,750	5.05	3,270	7.65	10,780
31.....	5.4	740	.....	.....	5.6	920	.....	.....	5.10	3,370	.....	.....

^a Ice conditions Jan. 1 to April 20.

^b Ice breaking up April 21 to April 25; discharges during this period interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1914.

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	8.60	14,390	7.70	10,970	6.45	6,720	5.30	3,800	4.48	2,322	6.40	955
2.....	8.75	14,960	7.85	11,540	6.25	6,160	5.37	3,954	4.45	2,280	5.90	905
3.....	8.95	15,720	7.95	11,920	6.50	6,860	5.35	3,910	4.46	2,294	5.75	850
4.....	9.00	15,910	8.12	12,566	6.47	6,776	5.30	3,800	4.42	2,238	5.80	825
5.....	9.20	16,670	7.95	11,920	6.55	7,010	5.17	3,514	4.42	2,238	5.60	818
6.....	9.22	16,746	7.40	9,870	6.55	7,010	5.10	3,370	4.40	2,210	5.65	818
7.....	9.00	15,910	7.75	11,160	6.12	5,796	5.10	3,370	4.38	2,182	5.45	818
8.....	8.85	15,340	7.70	10,970	6.20	6,020	5.07	3,310	4.32	2,098	5.30	815
9.....	8.65	14,580	7.10	8,810	6.55	7,010	5.12	3,410	4.38	2,182	5.15	803
10.....	8.40	13,630	6.75	7,650	5.95	5,330	5.40	4,020	4.48	2,322	5.40	802
11.....	8.50	14,010	6.55	7,010	5.77	4,862	5.55	4,350	4.38	2,182	5.40	810
12.....	8.60	14,390	6.75	7,650	5.95	5,330	5.45	4,130	4.32	2,098	5.45	814
13.....	9.00	15,910	6.72	7,554	5.75	4,810	5.20	3,580	4.25	2,000	5.50	816
14.....	9.15	16,480	6.85	7,970	5.45	4,130	5.10	3,370	9.00	1,700 ^b	5.70	825
15.....	9.07	16,176	6.85	7,970	5.35	3,910	5.07	3,310	9.30	1,480 ^a	5.90	832
16.....	8.80	15,150	7.15	8,980	5.55	4,350	5.02	3,216	9.40	1,474	5.90	826
17.....	8.00	12,110	7.15	8,980	5.15	3,470	5.00	3,180	9.40	1,485	5.60	826
18.....	7.65	10,780	7.02	8,538	5.12	3,410	5.07	3,310	9.50	1,514	5.80	830
19.....	7.87	11,616	6.85	7,970	5.25	3,690	5.02	3,216	9.45	1,526	6.20	837
20.....	8.25	13,060	7.00	8,470	5.20	3,580	4.92	3,036	9.30	1,529	6.30	843
21.....	8.40	13,630	7.15	8,980	5.15	3,470	4.90	3,000	9.30	1,502	6.70	860
22.....	7.50	10,230	7.10	8,810	5.20	3,580	4.75	2,730	9.10	1,475	6.70	878
23.....	7.07	8,708	7.17	9,048	5.05	3,270	4.72	2,682	8.90	1,433	6.65	890
24.....	7.10	8,810	7.00	8,470	4.95	3,090	4.67	2,602	8.40	1,398	6.60	893
25.....	7.17	9,048	6.60	7,170	5.05	3,270	4.55	2,420	8.35	1,328	6.50	892
26.....	7.25	9,330	6.55	7,010	5.22	3,624	4.55	2,420	7.90	1,300	6.35	885
27.....	7.10	8,810	6.62	7,234	5.40	4,020	4.58	2,462	7.60	1,250	6.35	875
28.....	7.05	8,640	6.75	7,650	5.65	4,570	4.52	2,378	7.45	1,254	6.45	870
29.....	7.52	10,302	6.92	8,198	5.55	4,350	4.50	2,350	7.60	1,270	6.50	876
30.....	7.30	9,510	6.80	7,810	5.25	3,690	4.48	2,322	7.30	1,040	6.40	882
31.....	7.37	9,762	6.72	7,554	.....	.....	4.45	2,280	.....	.....	6.35	880 ^a

^a Ice conditions Nov. 15 to Dec. 31.^b Ice forming Nov. 14; discharge for this date interpolated.

MONTHLY DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1914.

(Drainage area 4,030 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	920	720	848	0.210	0.24	52,141
February.....	830	650	729	0.181	0.19	40,487
March.....	940	800	862	0.214	0.25	53,002
April.....	1,750	900	1,114	0.276	0.31	66,286
May.....	6,300	1,894	4,104	1.020	1.18	252,343
June.....	18,000	4,350	10,808	2.680	2.99	643,080
July.....	16,746	8,640	12,914	3.200	3.69	794,059
August.....	12,566	7,010	8,016	2.210	2.55	548,222
September.....	7,010	3,090	4,772	1.180	1.32	283,950
October.....	4,350	2,280	3,187	0.791	0.91	195,964
November.....	2,322	1,040	1,753	0.435	0.48	104,310
December.....	955	802	850	0.211	0.24	52,264
The year.....	14.35	3,086,108

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DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1913.

DAY.	June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			8.65	14,580	7.65	10,780
2.....	7.60	10,590	8.70	14,770	8.30	13,250
3.....	7.50	10,230	8.20	12,870	8.60	14,390
4.....	7.55	10,410	8.75	14,960	8.90	15,530
5.....	7.55	10,410	8.25	13,060	9.00	15,910
6.....	7.50	10,230	7.05	8,640	8.85	15,340
7.....	7.20	9,150	7.50	10,230	8.90	15,530
8.....	7.55	10,410	9.15	16,480	8.55	14,200
9.....	8.55	14,210	8.00	12,110	9.85	19,140
10.....	9.00	15,910	7.75	11,160	10.35	21,040
11.....	9.35	17,240	7.90	11,730	9.80	18,950
12.....	9.05	16,100	7.80	11,350	9.85	19,140
13.....	8.80	15,150	7.50	10,230	10.80	22,750
14.....	8.65	14,580	8.05	12,300	10.30	20,850
15.....	8.20	12,870	7.50	10,230	9.60	18,190
16.....	7.25	9,330	7.05	8,640	8.65	14,580
17.....	7.20	9,150	6.95	8,300	8.10	12,490
18.....	7.35	9,690	7.05	8,640	7.70	10,970
19.....	7.45	10,050	7.40	9,870	7.40	9,870
20.....	7.75	11,160	8.25	13,060	7.00	8,470
21.....	9.25	16,860	8.85	15,340	6.65	7,330
22.....	8.30	13,250	9.90	19,330	7.05	8,640
23.....	7.75	11,160	10.35	21,040	6.70	7,490
24.....	7.55	10,410	9.90	19,330	7.30	9,510
25.....	7.65	10,780	9.80	18,950	7.65	10,780
26.....	8.55	14,200	9.75	18,760	7.65	10,780
27.....	8.25	13,060	9.20	16,670	7.80	11,350
28.....	8.40	13,630	8.85	15,340	7.65	10,780
29.....	8.45	13,820	8.80	15,150	7.30	9,510
30.....	8.50	14,010	8.30	13,250	7.65	10,780
31.....			7.65	10,780	7.90	11,730

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1913.

DAY.	September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	7.90	11,730	5.60	4,460	4.40	2,210	3.90	1,580
2.....	7.05	8,640	5.50	4,240	4.50	2,350	4.00	1,690
3.....	7.45	10,050	5.75	4,810	4.30	2,070	4.10	1,810
4.....	7.45	10,050	5.65	4,570	4.50	2,350	4.00	1,690
5.....	7.90	11,730	5.50	4,240	4.20	1,930	3.90	1,580
6.....	7.45	10,050	5.40	4,020	4.10	1,810	3.70	1,390
7.....	6.75	7,650	5.25	3,690	4.30	2,070	3.80	1,480
8.....	7.45	10,050	5.20	3,580	4.20	1,930	4.00	1,690
9.....	7.30	9,510	5.10	3,370	4.20	1,930	4.00	1,690
10.....	6.70	7,490	5.10	3,370	4.30	2,070	4.20	1,930
11.....	6.85	7,970	5.00	3,180	4.30	2,070	4.70	2,650
12.....	6.65	7,330	5.00	3,180	4.20	1,930	4.40	2,210
13.....	6.55	7,010	5.00	3,180	4.10	1,810	4.30	2,070
14.....	6.75	7,650	4.80	2,820	3.90	1,580	4.70	2,650
15.....	6.65	7,330	4.90	3,000	4.10	1,810	4.80	2,820
16.....	6.50	6,860	5.00	3,180	4.20	1,930	5.20	3,580
17.....	6.35	6,440	4.90	3,000	4.30	2,070	5.10	2,870 ^a
18.....	6.45	6,720	4.85	2,910	4.30	2,070	5.20	2,480
19.....	6.65	7,330	4.75	2,730	4.10	1,810	4.70	1,850
20.....	6.45	6,720	4.70	2,650	4.00	1,690	4.60	1,190 ^a
21.....	6.30	6,300	4.60	2,490	4.00	1,690	5.80	865 ^b
22.....	6.20	6,020	4.50	2,350	3.70	1,390	5.60	840
23.....	6.25	6,160	4.55	2,420	3.90	1,580	5.40	850
24.....	6.15	5,880	4.60	2,490	4.00	1,690	5.50	830
25.....	6.05	5,600	4.50	2,350	4.30	2,070	5.30	830
26.....	5.90	5,200	4.50	2,350	4.40	2,210	5.60	872
27.....	5.80	4,940	4.50	2,350	4.30	2,070	5.70	920
28.....	5.70	4,690	4.50	2,350	4.00	1,690	5.90	920
29.....	5.60	4,460	4.50	2,350	3.80	1,480	5.80	910
30.....	5.86	4,940	4.40	2,210	3.70	1,390	5.80	910
31.....			4.40	2,210			5.60	870 ^b

^a Ice forming Dec. 17 to Dec. 20; discharges interpolated during this period.^b Ice conditions Dec. 21 to Dec. 31.

MONTHLY DISCHARGE of North Saskatchewan River near Rocky Mountain House, for 1913.

(Drainage area 4,030 square miles.)

MONTH.	DISCHARGES IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
June (2-30).....	17,240	9,150	12,347	3.060	3.30	710,226
July.....	21,040	8,300	13,456	3.340	3.85	827,400
August.....	22,750	7,330	13,550	3.360	3.87	833,150
September.....	11,730	4,460	7,417	1.840	2.05	441,343
October.....	4,810	2,210	3,100	0.769	0.89	190,612
November.....	2,350	1,390	1,892	0.469	0.52	112,580
December.....	3,580	830	1,630	0.404	0.47	100,220
The period.....					14.95	3,215,531

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STURGEON RIVER AT McDONALD'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 14, Tp. 54, Rge. 5, W. 5th Mer., at ford near McDonald's ranch, 300 feet below mouth of creek passing under Canadian Northern Railway trestle at mile 54.

Records available.—April 21, 1914, to November 1, 1914.

Gauge.—Vertical staff, on left bank of river about 50 feet downstream from ford.

Bench-mark.—Six-inch spike driven in a 12-inch poplar tree, on left bank of stream, 10 feet downstream from gauge. Elevation 9.68 feet above zero of gauge.

Channel.—One channel at all stages, shifting.

Discharge measurements.—Made by wading.

Winter flow.—Gauge height observations discontinued on November 1st. One discharge measurement made under winter conditions.

Observer.—H. H. Jones.

Remarks.—Relation between gauge height and discharge changed during summer because of a growth of weeds in the river.

DISCHARGE MEASUREMENTS of Sturgeon River at McDonald's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 21.....	P. H. Daniels.....	29	17.4	0.78	2.54	13.6
May 22.....	do	29	16.0	0.62	2.50	10.0
June 9.....	do	55	134.0	1.51	5.28	204.0
June 24.....	do	49	101.0	1.27	5.18	128.0
July 8.....	do	46	111.0	1.01	5.10	112.0
July 25.....	do	44	95.0	0.80	5.20	76.0
Aug. 8.....	do	42	83.0	0.54	4.90	45.0
Aug. 21.....	do	45	76.0	0.53	4.75	40.0
Sept. 1.....	do	46	74.0	0.62	4.28	46.0
Oct. 6.....	do	40	54.0	0.91	3.60	49.0
Oct. 17.....	do	37	52.0	0.75	3.45	39.0
Dec. 21.....	do	30	22.0	0.66	3.08	14.1

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River at McDonald's Ranch, for 1914.

DAY.	April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			2.50	11.0	2.50	11.0	5.31	139
2.....			2.50	11.0	2.50	11.0	5.30	138
3.....			2.50	11.0	2.56	12.2	5.30	137
4.....			2.50	11.0	2.75	16.8	5.30	136
5.....			2.50	11.0	3.48	42.0	5.30	135
6.....			2.50	11.0	3.76	55.0	5.30	135
7.....			2.50	11.0	4.14	79.0	5.32	136
8.....			2.50	11.0	5.95	297.0	5.31	134
9.....			2.50	11.0	5.28	203.0	5.26	126
10.....			2.50	11.0	5.18	186.0	5.24	121
11.....			2.50	11.0	5.18	184.0	5.20	114
12.....			2.50	11.0	5.08	166.0	5.20	111
13.....			2.40	9.0	4.98	148.0	5.22	108
14.....			2.40	9.0	4.93	140.0	5.25	110
15.....			2.40	9.0	4.92	134.0	5.23	106
16.....			2.40	9.0	4.90	130.0	5.22	102
17.....			2.40	9.0	4.87	122.0	5.20	98
18.....			2.40	9.0	4.87	118.0	5.20	94
19.....			2.50	11.0	4.87	115.0	5.20	92
20.....			2.50	11.0	4.87	111.0	5.21	90
21.....	2.60	13.0 ^a	2.50	11.0	4.89	110.0	5.21	88
22.....	2.50	11.0	2.50	11.0	4.92	109.0	5.20	84
23.....	2.50	11.0	2.51	11.2	4.91	105.0	5.20	81
24.....	2.50	11.0	2.52	11.4	4.93	103.0	5.20	79
25.....	2.60	13.0	2.52	11.4	5.30	141.0	5.20	76
26.....	2.50	11.0	2.51	11.2	5.33	144.0	5.20	75
27.....	2.50	11.0	2.51	11.2	5.33	144.0	5.20	74
28.....	2.50	11.0	2.52	11.4	5.32	142.0	5.20	73
29.....	2.50	11.0	2.51	11.2	5.32	141.0	5.20	72
30.....	2.50	11.0	2.51	11.2	5.31	139.0	5.19	71
31.....			2.50	11.0			5.20	70

^a Station established.

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DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River at McDonald's Ranch, for 1914.

DAY.	August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	5.15	67	4.28	46	3.80	52
2.....	5.15	65	4.25	46	3.80	53
3.....	5.14	63	4.24	46	3.78	53
4.....	5.12	61	4.21	46	3.76	54
5.....	5.20	65	4.19	46	3.74	54
6.....	5.20	63	4.10	42	3.70	52
7.....	5.15	59	4.10	43	3.68	51
8.....	5.15	58	4.20	49	3.64	49
9.....	5.18	60	4.30	55	3.61	48
10.....	5.10	56	4.20	51	3.61	48
11.....	5.04	52	4.20	52	3.60	47
12.....	5.02	52	4.20	53	3.60	47
13.....	5.00	51	4.18	53	3.57	46
14.....	4.96	49	4.14	52	3.54	45
15.....	4.94	48	4.10	51	3.50	43
16.....	4.94	48	4.10	52	3.48	42
17.....	4.90	47	4.10	53	3.46	41
18.....	4.85	45	4.10	54	3.44	41
19.....	4.80	42	4.20	60	3.42	40
20.....	4.74	40	4.10	56	3.40	39
21.....	4.70	38	4.10	57	3.30	35
22.....	4.67	39	4.08	57	3.30	35
23.....	4.67	42	4.08	58	3.30	35
24.....	4.68	45	4.05	57	3.30	35
25.....	4.64	45	4.00	56	3.30	35
26.....	4.60	45	3.92	53	3.30	35
27.....	4.55	46	3.92	53	3.30	35
28.....	4.51	47	3.90	54	3.30	35
29.....	4.45	47	3.86	52	3.30	35
30.....	4.40	47	3.80	51	3.30	35
31.....	4.34	46			3.20	31

MONTHLY DISCHARGE of Sturgeon River at McDonald's Ranch, for 1914.

(Drainage area 100 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (21-30).....	13.0	11.0	11.4	0.114	0.04	226
May.....	11.4	9.0	10.7	0.107	0.12	658
June.....	297.0	11.0	119.0	1.190	1.33	7,081
July.....	139.0	70.0	103.0	1.030	1.19	6,333
August.....	67.0	38.0	51.0	0.510	0.59	3,136
September.....	60.0	42.0	52.0	0.520	0.58	3,094
October.....	54.0	31.0	43.0	0.430	0.50	2,644
The period.....					4.35	23,172

STURGEON RIVER NEAR ONOWAY.

Location.—On the SE. $\frac{1}{4}$ of Sec. 7, Tp. 55, Rge. 2, W. of 5th Mer., at a highway bridge about 3 miles northwest of Onoway, near Trek's ranch.

Records available.—April 23, 1914, to November 1, 1914.

Gauge.—Vertical staff, spiked to pile near centre of downstream side of bridge.

Bench-mark.—Six-inch spike driven in pile on downstream side of east abutment. Elevation 4.84 feet above zero of gauge.

Channel.—One channel at all stages, permanent.

Discharge measurements.—Made from bridge.

Winter flow.—Gauge height observations discontinued on November 1st. One discharge measurement made under ice conditions.

Observer.—J. Calnan.

Remarks.—Relation of gauge height to discharge changed during summer because of a growth of weeds in the river.

DISCHARGE MEASUREMENTS of Sturgeon River near Onoway, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 23.....	P. H. Daniells.....	34	54	1.10	2.06	60
May 21.....	do.....	33	64	0.85	2.02	46
June 6.....	do.....	36	69	1.35	2.43	93
June 23.....	do.....	37	86	1.70	2.79	147
July 7.....	do.....	37	79	1.26	2.70	100
July 24.....	do.....	35	64	0.90	2.42	58
Aug. 7.....	do.....	36	69	0.69	2.64	48
Aug. 20.....	do.....	36	72	0.56	2.53	41
Sept. 4.....	do.....	36	66	0.63	2.46	42
Sept. 22.....	do.....	36	68	0.85	2.48	57
Oct. 3.....	do.....	36	69	0.95	2.48	66
Oct. 20.....	do.....	36	64	1.04	2.39	67
Dec. 19.....	do.....	20	23	2.10	2.92	49

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DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Oneway, for 1914.

Date.	April.		May.		June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.00	50	2.00	50	2.70	113
2.....			2.00	50	2.00	50	2.70	111
3.....			2.00	50	2.00	50	2.70	108
4.....			2.00	50	2.00	50	2.60	93
5.....			2.00	50	2.30	74	2.60	91
6.....			2.00	50	2.40	84	2.60	89
7.....			2.00	50	3.00	202	2.70	100
8.....			2.01	51	3.00	202	2.70	100
9.....			2.01	51	3.83	481	2.70	99
10.....			2.01	51	3.21	267	2.70	99
11.....			2.01	51	3.00	202	2.70	99
12.....			2.01	51	2.70	128	2.60	86
13.....			2.01	51	2.70	128	2.60	85
14.....			2.01	51	2.70	128	2.60	84
15.....			2.01	51	2.60	111	2.60	83
16.....			2.01	51	2.60	111	2.60	82
17.....			2.01	51	2.60	111	2.50	72
18.....			2.01	51	2.60	111	2.45	67
19.....			2.01	51	2.70	128	2.40	62
20.....			2.01	51	2.70	128	2.45	65
21.....			2.00	50	2.70	128	2.45	64
22.....			2.00	50	2.70	128	2.45	63
23.....			2.00	50 ^a	2.80	149	2.40	58
24.....			2.00	50	2.70	126	2.40	57
25.....			2.00	50	2.70	124	2.40	55
26.....			2.00	50	2.70	122	2.40	53
27.....			2.00	50	2.70	121	2.40	51
28.....			2.00	50	2.70	117	2.40	50
29.....			2.00	50	2.70	117	2.40	48
30.....			2.00	50	2.70	115	2.40	46
31.....			2.00	50			2.50	51

^a Station established.

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Onoway, for 1914.

DAY.	August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.50	49	2.50	44	2.50	66
2.....	2.50	47	2.50	44	2.50	67
3.....	2.60	52	2.50	45	2.50	68
4.....	2.60	51	2.50	45	2.50	69
5.....	2.60	49	2.50	46	2.50	70
6.....	2.60	47	2.50	47	2.50	71
7.....	2.60	46	2.50	48	2.50	72
8.....	2.60	46	2.50	49	2.50	73
9.....	2.60	46	2.60	56	2.50	74
10.....	2.60	46	2.60	57	2.50	76
11.....	2.60	46	2.60	58	2.50	77
12.....	2.60	46	2.60	59	2.50	78
13.....	2.60	46	2.60	59	2.50	80
14.....	2.60	46	2.50	53	2.50	81
15.....	2.60	46	2.50	54	2.50	82
16.....	2.60	46	2.50	55	2.50	83
17.....	2.60	46	2.50	56	2.50	85
18.....	2.60	46	2.50	56	2.50	86
19.....	2.60	46	2.50	57	2.50	87
20.....	2.60	46	2.50	57	2.40	78
21.....	2.60	47	2.50	58	2.40	84
22.....	2.60	47	2.50	58	2.40	84
23.....	2.60	48	2.50	59	2.40	84
24.....	2.50	41	2.50	60	2.40	84
25.....	2.50	41	2.50	61	2.40	84
26.....	2.50	42	2.50	62	2.40	84
27.....	2.50	42	2.50	63	2.30	74
28.....	2.50	42	2.50	64	2.30	74
29.....	2.50	43	2.50	65	2.30	74
30.....	2.50	43	2.50	65	2.30	74
31.....	2.50	43			2.30	74

MONTHLY DISCHARGE of Sturgeon River near Onoway, for 1914.

(Drainage area 241 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (23-30).....	50	50	50	0.207	0.06	793
May.....	51	50	50	0.207	0.24	3,074
June.....	481	50	135	0.560	0.62	8,033
July.....	113	46	77	0.320	0.37	4,734
August.....	52	41	46	0.191	0.22	2,828
September.....	65	44	55	0.228	0.25	3,273
October.....	87	66	77	0.320	0.37	4,734
The period.....					2.13	27,169

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STURGEON RIVER NEAR VILLENEUVE.

Location.—On the NW. $\frac{1}{4}$ Sec. 32, Tp. 54, Rge. 26, W. 4th Mer., at the highway bridge near Majeau's ranch, about $2\frac{1}{2}$ miles north of Villeneuve and about 3 miles west of Ray.

Records available.—April 22, 1914, to October 31, 1914.

Gauge.—Vertical staff, spiked to upstream end of the pier near the right bank; elevation 88.97 feet.

Bench-mark.—Spike driven in 12-inch pile in the east abutment of bridge; assumed elevation 100.00 feet.

Channel.—Straight for about 25 feet on either side of section. Gravel bed covered with clay and sand, fairly permanent. Two channels at high stages, one channel at low stages.

Discharge measurements.—Made from bridge.

Winter flow.—Gauge height observations discontinued on November 1st. One discharge measurement made under winter conditions.

Observer.—V. Majeau.

DISCHARGE MEASUREMENTS of Sturgeon River near Villeneuve, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 22.....	P. H. Daniels.....	48	194	0.51	3.55	101
May 20.....	do.....	55	169	0.46	2.91	78
June 5.....	do.....	47	246	1.07	4.50	263
June 22.....	do.....	61	377	1.60	6.94	632
July 6.....	do.....	56	284	1.39	5.65	396
July 23.....	do.....	45	209	0.89	4.00	184
Aug. 6.....	do.....	44	170	0.61	3.03	87
Aug. 19.....	do.....	43	162	0.46	2.98	74
Sept. 3.....	do.....	43	152	0.40	2.68	61
Sept. 21.....	do.....	44	174	0.58	3.20	102
Oct. 2.....	do.....	44	178	0.63	3.24	113
Oct. 19.....	do.....	44	185	0.61	3.30	113
Dec. 18.....	do.....	63	85	0.68	3.59	58

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Villeneuve, for 1914.

DAY.	April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			3.00	85	2.60	52	6.90	625
2.....			3.00	85	2.60	52	6.30	517
3.....			2.90	86	2.50	44	5.90	449
4.....			2.90	76	2.60	52	5.60	400
5.....			3.00	85	4.30	224	5.50	384
6.....			3.00	85	5.45	376	5.60	400
7.....			3.00	85	6.50	553	5.70	416
8.....			3.00	85	8.25	867	5.80	432
9.....			3.00	85	10.30	1,237 ^a	5.90	449
10.....			2.90	76	11.10	1,381 ^a	5.90	449
11.....			2.90	76	11.20	1,399 ^a	5.70	416
12.....			2.80	68	11.40	1,435 ^a	5.60	400
13.....			2.70	60	11.20	1,399 ^a	5.50	384
14.....			2.70	60	11.00	1,363 ^a	5.50	384
15.....			2.70	60	10.30	1,237	5.70	416
16.....			2.70	60	9.70	1,129	6.10	483
17.....			2.70	60	9.00	1,003	6.00	466
18.....			2.70	60	8.40	895	5.60	400
19.....			2.70	60	7.90	805	4.70	273
20.....			2.80	68	7.10	661	4.40	236
21.....			3.00	85	7.10	661	4.20	212
22.....	3.40	124	3.10	94	6.90	625	4.10	200
23.....	3.10	94	3.20	104	7.30	697	4.00	188
24.....	3.10	94	3.20	104	7.70	769	3.90	177
25.....	3.10	94	3.10	94	8.00	823	3.80	166
26.....	3.10	94	3.00	85	8.30	877	3.70	155
27.....	3.10	94	2.90	76	8.40	895	3.60	144
28.....	3.00	85	2.80	68	8.40	895	3.50	134
29.....	3.00	85	2.80	68	8.00	823	3.40	124
30.....	3.00	85	2.70	60	7.50	733	3.40	124
31.....			2.70	60			3.40	124

^a Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Villeneuve, for 1914.

DAY.	August		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gau e Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec. ft.	Feet.	Sec.-ft.
1.....	3.35	119	2.70	60	3.30	114
2.....	3.30	114	2.70	60	3.20	104
3.....	3.30	114	2.70	60	3.30	114
4.....	3.20	104	2.70	60	3.30	114
5.....	3.10	94	2.70	60	3.30	114
6.....	3.10	94	2.60	52	3.40	124
7.....	3.10	94	2.60	52	3.50	134
8.....	3.00	85	2.70	60	3.50	134
9.....	3.00	85	2.90	76	3.50	134
10.....	3.10	94	3.00	85	3.50	134
11.....	3.10	94	3.00	85	3.50	134
12.....	3.10	94	3.10	94	3.40	124
13.....	3.00	85	3.10	94	3.40	124
14.....	3.00	85	3.00	85	3.30	114
15.....	3.00	85	3.00	85	3.30	114
16.....	3.00	85	3.00	85	3.30	114
17.....	3.00	85	3.00	85	3.30	114
18.....	3.00	85	3.00	85	3.30	114
19.....	3.00	85	3.00	85	3.30	114
20.....	3.00	85	3.10	94	3.30	114
21.....	2.90	76	3.20	104	3.30	114
22.....	2.90	6	3.20	104	3.20	104
23.....	2.90	76	3.20	104	3.20	104
24.....	2.90	76	3.30	114	3.20	104
25.....	2.90	76	3.30	114	3.10	94
26.....	2.90	76	3.30	114	3.10	94
27.....	2.90	76	3.30	114	3.10	94
28.....	2.90	76	3.30	114	3.00	85
29.....	2.80	68	3.30	114	3.00	85
30.....	2.80	68	3.30	114	3.00	85
31.....	2.70	60	.....	.....	3.00	85

MONTHLY DISCHARGE of Sturgeon River near Villeneuve, for 1914.

(Drainage area 506 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OF	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (22-30).....	124	85	94	0.186	0.06	1,678
May.....	104	60	76	0.150	0.17	4,673
June.....	1,435	44	799	1.579	1.76	47,544
July.....	625	124	327	0.646	0.74	20,106
August.....	119	60	86	0.170	0.20	5,288
September.....	114	52	87	0.172	0.19	5,177
October.....	134	85	111	0.219	0.25	6,825
The period.....	.....	.....	.....	.....	3.37	91,291

STURGEON RIVER AT ST. ALBERT.

Location.—Between river lots 27 and 52, St. Albert Settlement, at the steel traffic bridge in the town of St. Albert.

Records available.—April 23, 1913, to December 31, 1914.

Gauge.—Vertical staff, fastened to timber cribbing on right bank of river, and on upstream side of bridge; elevation of zero maintained at 90.23 since establishment.

Bench-mark.—Marked with white paint on the cement sill of the east basement window of the St. Albert hotel; assumed elevation 100.00 feet.

Channel.—One channel, with considerable growth of vegetation, at all stages.

Discharge measurements.—Made from bridge.

Winter flow.—From November to April river is frozen over, and measurements are made at a point about one-quarter of a mile below the bridge.

Observer.—C. Pelletier.

DISCHARGE MEASUREMENTS of Sturgeon River at St. Albert, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 16.....	P. H. Daniells.....	82 ^a	62.4	0.37	2.05	23
Jan. 30.....	do.....	75 ^a	53.0	0.45	2.12	24
Feb. 14.....	do.....	73 ^a	49.3	0.46	2.03	22
Mar. 16.....	do.....	79 ^a	69.8	0.51	3.01	36
April 9.....	do.....	83 ^a	128.0	0.50	3.37	63
April 25.....	do.....	86	224.0	0.98	2.53	220
April 30.....	G. J. Smith and J. M. Paul...	86	199.0	0.99	2.24	196
May 25.....	J. M. Paul.....	86	143.0	0.67	1.50	96
June 15.....	do.....	86	752.0	2.11	8.14	1,587
July 4.....	do.....	86	645.0	1.56	6.99	1,005
July 24.....	do.....	86	430.0	1.33	4.51	571
Aug. 19.....	do.....	82	178.0	0.75	1.67	134
Sept. 2.....	do.....	80	153.0	0.61	1.32	94
Sept. 21.....	do.....	82	163.0	0.60	1.46	98
Oct. 6.....	do.....	82	180.0	0.72	1.71	130
Nov. 4.....	P. H. Daniells.....	88	184.0	0.71	1.61	130
Nov. 21.....	do.....	77 ^a	178.0	0.52	1.92	93
Dec. 10.....	do.....	91 ^a	111.0	0.66	1.92	73

^a Measured below regular station.

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DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River at St. Albert, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.00	32 ^a	2.12	24	2.87	28	3.51	51	2.25	190	1.20	84
2.....	2.01	32	2.10	22	2.88	31	3.51	54	2.25	190	1.06	74
3.....	2.01	32	2.09	21	2.88	34	3.50	54	2.15	178	1.11	78
4.....	2.00	33	2.09	20	2.89	34	3.49	54	2.25	190	1.22	86
5.....	2.00	33	2.09 ^c	16	2.89	33	3.47	56	2.22	186	1.71	131
6.....	2.01	34	2.13	17	2.90	32	3.45	57	2.12	174	1.78	138
7.....	2.01	38	2.17	18	2.90	34	3.43	59	2.11	173	2.34	201
8.....	2.01	30	2.23	18	2.90	33	3.41	61	2.07	168	3.09	302
9.....	2.01	22	2.27	18	2.92	31	3.40	63	2.00	160	3.94	436
10.....	2.02	23	2.29	20	2.92	30	3.39	67	1.95	155	4.90	614
11.....	2.01	24	2.33	22	2.92	31	3.37	71	1.86	146	6.00	852
12.....	2.01	18	2.20	22	2.92	32	3.42	76	1.84	144	6.92	1,094
13.....	2.03	20	2.07 ^c	22	2.93	33	3.43	80 ^a	1.80	140	7.40	1,228
14.....	2.03	22	2.03	22	2.95	34	3.47	160 ^b	1.70	130	7.90	1,378
15.....	2.03	24	2.80	24	2.95	35	3.61	290 ^b	1.73	133	8.07	1,432
16.....	2.03	23	2.82	30	2.96	36	3.55	372	1.68	128	8.24	1,487
17.....	2.04	22	2.82	27	3.55	37	3.22	321	1.62	122	8.24	1,487
18.....	2.07	21	2.82	24	3.55	38	3.10	303	1.56	116	8.25	1,490
19.....	2.08	20	2.82	20	3.55	36	3.01	290	1.54	114	8.25	1,490
20.....	2.10	19	2.82	20	3.55	38	2.92	277	1.61	121	8.10	1,442
21.....	2.11	18	2.82	20	3.55	40	2.87	270	1.43	103	7.96	1,397
22.....	2.11	17	2.82	20	3.55	41	2.75	253	1.47	107	7.94	1,391
23.....	2.10	16	2.82	21	3.55	42	2.67	242	1.47	107	7.80	1,346
24.....	2.10	17	2.83	22	3.55	42	2.62	235	1.47	107	7.73	1,325
25.....	2.11	18	2.87	23	3.55	42	2.55	226	1.50	110	7.65	1,301
26.....	2.11	19	2.87	25	3.54	42	2.43	212	1.60	120	7.60	1,286
27.....	2.11	20	2.87	26	3.54	42	2.23	188	1.45	105	7.64	1,298
28.....	2.11	19	2.87	27	3.54	43	2.22	186	1.59	119	7.62	1,292
29.....	2.11	18	.....	.....	3.54	44	2.16	179	1.56	116	7.54	1,269
30.....	2.11	24	.....	.....	3.53	46	2.20	184	1.44	104	7.53	1,266
31.....	2.11	26	.....	.....	3.52	48	.....	.....	1.31	93	.....	.....

^a Ice conditions from Jan. 1 to April 13.^b Ice breaking up April 14 and 15; discharges for these days interpolated.^c Gauge heights interpolated Feb. 5 to Feb. 13.

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River at St. Albert, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	7.45	1,242	3.24	324	1.34	95	1.61	121	1.67	127	2.02	84
2.....	7.34	1,211	3.04	294	1.29	91	1.61	121	1.65	125	2.07	82
3.....	7.20	1,172	3.00	288	1.24	87	1.65	125	1.65	125	1.91	80
4.....	7.05	1,130	2.88	271	1.19	83	1.64	124	1.64	124	1.97	74
5.....	6.89	1,085	2.74	252	1.26	89	1.70	130	1.60	120	1.99	68
6.....	6.76	1,049	2.51	221	1.20	84	1.74	134	1.61	121	2.01	69
7.....	6.60	1,006	2.50	220	1.16	81	1.75	135	1.62	122	2.02	70
8.....	6.50	980	2.41	209	1.21	85	1.75	135	1.62	122	1.97	72
9.....	6.35	941	2.34	201	1.40	100	1.75	135	1.65	125	2.02	74
10.....	6.28	923	2.20	184	1.35	96	1.75	135	1.62	122	1.97	73
11.....	6.12	882	2.14	177	1.34	95	1.78	138	1.63	123	1.97	65
12.....	6.04	862	2.05	166	1.35	96	1.77	137	1.66	126	1.98	63
13.....	5.93	836	2.00	160	1.35	96	1.79	139	2.05	117b	1.97	68
14.....	5.87	822	1.92	152	1.48	108	1.80	140	2.01	106b	1.95	70
15.....	5.81	808	1.90	150	1.46	106	1.80	140	2.00	104a	1.94	72
16.....	5.64	771	1.85	145	1.40	100	1.75	135	1.90	102	1.92	74
17.....	5.52	744	1.79	139	1.35	96	1.80	140	1.90	100	1.92	76
18.....	5.39	716	1.74	134	1.35	96	1.80	140	1.90	102	1.96	74
19.....	5.19	672	1.67	127	1.45	105	1.79	139	1.90	104	1.96	69
20.....	5.11	656	1.62	122	1.46	106	1.79	139	1.90	106	1.93	64
21.....	5.04	642	1.56	116	1.46	106	1.79	139	1.88	93	1.95	66
22.....	4.86	606	1.54	114	1.50	110	1.76	136	1.88	88	1.94	66
23.....	4.64	564	1.52	112	1.50	110	1.76	136	1.88	88	1.93	64
24.....	4.51	539	1.51	111	1.51	111	1.74	134	1.88	86	1.97	62
25.....	4.34	507	1.48	108	1.51	111	1.72	132	1.88	82	1.97	57
26.....	4.11	466	1.46	106	1.53	113	1.70	130	1.88	78	1.97	53
27.....	3.93	434	1.45	105	1.57	117	1.70	130	1.89	79	2.02	50
28.....	3.80	412	1.45	105	1.60	120	1.69	129	1.89	80	2.02	53
29.....	3.70	396	1.42	102	1.60	120	1.68	128	1.88	82	2.02	56
30.....	3.50	364	1.39	99	1.61	121	1.68	128	1.89	83	2.02	56
31.....	3.40	348	1.40	100	.....	.....	1.69	129	.....	.....	2.02	58a

a Ice conditions Nov. 15 to Dec. 31.

b Ice forming Nov. 13 and 14; discharges interpolated.

MONTHLY DISCHARGE of Sturgeon River at St. Albert, for 1914.

(Drainage area 1,010 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	38	16	24	0.024	0.03	1,476
February.....	30	16	22	0.022	0.02	1,222
March.....	48	28	37	0.037	0.04	2,275
April.....	372	51	166	0.164	0.18	9,878
May.....	190	93	137	0.136	0.16	8,424
June.....	1,490	74	956	0.946	1.06	56,886
July.....	1,242	348	767	0.759	0.88	47,161
August.....	324	99	165	0.163	0.19	10,145
September.....	121	81	101	0.100	0.11	6,010
October.....	140	121	133	0.132	0.15	8,178
November.....	127	78	105	0.104	0.12	6,248
December.....	84	50	67	0.066	0.08	4,120
The year.....	.....	.....	.....	.....	3.02	162,023

SESSIONAL PAPER No. 25c

STURGEON RIVER NEAR FORT SASKATCHEWAN.

Location.—On the NW. $\frac{1}{4}$ Sec. 28, Tp. 55, Rge. 22, W. 4th Mer., at the steel traffic bridge about five miles north of Fort Saskatchewan and $1\frac{1}{2}$ miles from the mouth of the river.

Records available.—January 1, 1914, to December 31, 1914. Discharge measurements only during 1913.

Gauge.—Vertical staff, fastened to pile near right bank of river; elevation of zero maintained at 87.52 feet since establishment.

Bench-mark.—Marked with white paint on top of the downstream side of the left abutment; assumed elevation 100.00 feet.

Channel.—One permanent channel at all stages.

Discharge measurements.—Made from downstream side of bridge.

Winter flow.—From November to April river is frozen over, and measurements are made at the regular station or a point about one-quarter of a mile above the mouth of the river.

Observer.—A. McDougall.

Remarks.—Owing to the ice being flooded it is sometimes not possible to make winter measurements at the regular station.

DISCHARGE MEASUREMENTS of Sturgeon River near Fort Saskatchewan, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 15.....	P. H. Daniels.....	41	86.3	0.37	4.00	32
Jan. 31.....	do	32 ^a	51.3	0.47	4.70	24
Feb. 17.....	do	37 ^a	56.6	0.52	5.35	30
Mar. 14.....	do	32 ^a	49.8	0.74	5.14	36
April 8.....	do	30	30.0	2.14	6.13	64
April 29.....	do	51	148.0	1.24	3.27	184
May 1.....	G. J. Smith and J. M. Paul...	52	151.0	1.30	3.41	196
May 26.....	J. M. Paul.....	53	130.0	0.78	2.97	101
June 16.....	do	78	386.0	3.74	5.79	1,442
July 3.....	do	78	361.0	3.87	5.63	1,376
July 25.....	do	78	245.0	2.56	4.29	627
Aug. 18.....	do	65	164.0	1.08	3.25	176
Aug. 31.....	do	64	154.0	0.76	3.06	117
Sept. 19.....	do	64	148.0	0.78	3.07	115
Oct. 3.....	do	65	149.0	0.91	3.16	135
Nov. 3.....	P. H. Daniels.....	65	152.0	0.95	3.14	143
Nov. 25.....	do	65	140.0	0.76	3.36	106
Dec. 9.....	.....	59	100.0	0.73	3.50	73

^a Measured below regular station.

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Fort Saskatchewan, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.70	37 ^a	4.70	26	5.16	33	5.78	51	3.36	193	2.84	86
2.....	3.70	37	4.60	24	5.27	34	5.79	54	3.35	190	2.84	86
3.....	3.70	38	4.50	22	5.35	36	5.90	54	3.43	218	2.84	86
4.....	3.80	38	4.30	19	5.20	35	6.02	54	3.42	215	2.99	105
5.....	3.60	39	4.30	16	5.11	35	6.03	57	3.30	173	3.24	155
6.....	3.70	40	4.50	18	5.03	34	6.04	59	3.29	170	3.49	242
7.....	3.80	46	4.70	20	5.04	36	6.06	62	3.28	167	3.69	331
8.....	3.80	36	5.00	20	4.96	34	6.07	64	3.26	161	3.99	475
9.....	3.80	26	5.20	20	4.97	32	6.16	68	3.25	158	4.64	808
10.....	3.80	28	5.30	23	4.98	33	5.95	71	3.23	153	4.84	916
11.....	3.80	30	5.50	26	5.00	34	6.14	74	3.22	150	5.04	1,024
12.....	3.90	22	5.10	24	5.01	35	6.03	78	3.21	148	5.04	1,024
13.....	3.90	28	5.20	24	5.02	36	5.92	82	3.09	121	5.19	1,108
14.....	4.00	36	5.00	22	5.14	37	5.71	170	3.08	119	5.39	1,224
15.....	4.00	32	4.80	20	5.15	37	5.50	300	3.06	116	5.59	1,340
16.....	3.80	30	5.60	38	5.06	38	5.29	380	3.05	114	5.78	1,450
17.....	3.90	26	5.30	30	5.08	36	5.18	340 ^a	3.04	112	5.88	1,508
18.....	4.10	24	5.11	27	5.19	37	5.47	320 ^b	3.02	109	5.98	1,566
19.....	4.30	23	4.83	24	5.30	38	5.56	300	3.01	108	6.08	1,624
20.....	4.20	21	4.74	23	5.52	39	5.45	290	2.99	105	6.08	1,624
21.....	4.10	20	4.65	22	5.73	40	5.54	280	2.98	103	6.08	1,624
22.....	4.10	18	4.37	22	5.64	41	5.33	270	2.97	102	6.43	1,827
23.....	4.20	16	4.47	22	5.66	42	4.92	258	2.95	99	6.28	1,740
24.....	4.30	17	4.69	28	5.77	42	4.81	250 ^b	2.94	98	6.18	1,682
25.....	4.40	18	4.91	29	5.58	42	3.50	246	2.94	98	6.08	1,624
26.....	4.60	20	5.02	30	5.30	42	3.49	242	2.94	98	6.08	1,624
27.....	4.70	22	5.03	31	5.71	42	3.48	238	2.94	98	5.98	1,566
28.....	4.80	20	5.05	32	5.42	43	3.47	234	2.94	98	5.98	1,566
29.....	4.80	18	.....	.....	5.44	45	3.42	215	2.94	98	5.88	1,508
30.....	4.80	21	.....	.....	5.55	46	3.47	234	2.94	98	5.88	1,508
31.....	4.70	24	.....	.....	5.76	49	.....	.....	2.84	86	.....	.....

^a Ice conditions Jan. 1 to April 17.^b Ice breaking up April 18 to April 24; discharges interpolated during this period.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Sturgeon River near Fort Saskatchewan, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	5.78	1,450	3.90	432	3.10	123	3.10	123	3.16	135	3.50	80
2.....	5.73	1,421	3.90	432	3.00	106	3.20	145	3.16	135	3.50	83
3.....	5.68	1,392	3.80	384	3.00	106	3.20	145	3.16	135	3.50	84
4.....	5.53	1,305	3.75	360	3.00	106	3.19	143	3.19	143	3.50	84
5.....	5.48	1,276	3.70	336	3.00	106	3.19	143	3.19	143	3.40	82
6.....	5.68	1,392	3.65	312	3.00	106	3.19	143	3.19	143	3.40	80
7.....	5.28	1,160	3.60	290	3.00	106	3.19	143	3.19	143	3.50	76
8.....	5.18	1,103	3.50	246	3.00	106	3.19	143	3.19	143	3.50	75
9.....	5.18	1,103	3.50	246	3.00	106	3.19	143	3.32	180	3.50	73
10.....	5.08	1,047	3.50	246	3.00	106	3.19	143	3.29	170	3.50	69
11.....	5.08	1,047	3.50	246	3.10	123	3.19	143	3.38	200	3.50	64
12.....	4.98	991	3.40	207	3.10	123	3.18	140	3.28	167	3.50	64
13.....	4.98	991	3.40	207	3.10	123	3.18	140	3.28	167	3.50	65
14.....	4.88	937	3.40	207	3.10	123	3.18	140	3.38	120 ^b	3.50	67
15.....	4.88	937	3.35	190	3.10	123	3.18	140	3.48	93	3.50	69
16.....	4.78	883	3.30	173	3.10	123	3.18	140	3.57	89	3.50	71
17.....	4.78	883	3.30	173	3.10	123	3.18	140	3.57	86	3.50	72
18.....	4.68	829	3.20	145	3.00	106	3.18	140	3.37	86 ^b	3.50	72
19.....	4.68	829	3.20	145	3.10	123	3.18	140	3.37	86 ^a	3.50	72
20.....	4.58	776	3.20	145	3.10	123	3.17	138	3.37	90	3.50	71
21.....	4.48	724	3.20	145	3.10	123	3.17	138	3.26	98	3.50	68
22.....	4.48	724	3.20	145	3.10	123	3.17	138	3.26	102	3.50	69
23.....	4.48	724	3.20	145	3.10	123	3.17	138	3.36	104	3.50	66
24.....	4.38	672	3.10	123	3.10	123	3.17	138	3.36	106	3.40	56
25.....	4.29	625	3.10	123	3.10	123	3.17	138	3.30	106	3.40	54
26.....	4.20	580	3.10	123	3.10	123	3.17	138	3.30	105	3.40	53
27.....	4.20	580	3.10	123	3.10	123	3.17	138	3.40	103	3.50	52
28.....	4.10	530	3.10	123	3.10	123	3.16	135	3.40	96	3.50	55
29.....	4.05	505	3.10	123	3.10	123	3.16	135	3.40	76	3.50	60
30.....	4.00	480	3.10	123	3.10	123	3.16	135	3.50	76	3.60	61
31.....	4.00	480	3.10	123			3.16	135			3.60	60 ^a

^a Ice conditions Nov. 19 to Dec. 31.^b Ice forming Nov. 14 to Nov. 18; discharges interpolated during this period.

MONTHLY DISCHARGE of Sturgeon River near Fort Saskatchewan, for 1914.

(Drainage area 1,330 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	46	16	27	0.020	0.02	1,660
February.....	38	16	24	0.018	0.02	1,333
March.....	49	32	38	0.029	0.03	2,336
April.....	380	51	180	0.135	0.15	10,711
May.....	218	86	132	0.099	0.11	8,116
June.....	1,827	86	1,102	0.828	0.92	65,573
July.....	1,450	480	915	0.688	0.79	56,261
August.....	432	123	211	0.159	0.18	12,974
September.....	123	106	117	0.088	0.10	6,962
October.....	145	123	139	0.104	0.12	8,547
November.....	200	76	121	0.091	0.10	7,200
December.....	84	52	69	0.052	0.06	4,243
The year.....					2.60	185,916

NORTH SASKATCHEWAN RIVER AT EDMONTON.

Location.—On the NW. $\frac{1}{4}$ Sec. 33, Tp. 52, Rge. 24, W. 4th Mer., at the low-level traffic and railway bridge in the city of Edmonton.

Records available.—May 1, 1911, to December 31, 1914.

Gauge.—Two vertical staff gauges at this station, a low-level one reading from 0 to 10 feet, and a high-level one reading from 10 to 34 feet. The high-level gauge is spiked to a timber pier a short distance above the mill of the Edmonton Lumber Company, the low-level being attached to a pier about 75 feet above the other and 200 feet from the right bank of the river. Zero elevation of low-level gauge maintained at 1,991.73 feet during 1911. Zero elevation of low-level gauge maintained at 1,991.09 feet during 1912-14. Zero elevation of high-level gauge maintained at 1,995.67 feet during 1911-12. Zero elevation of high-level gauge maintained at 1,991.09 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark under stay line to stack of mill and about 50 feet downstream from high-level gauge; elevation 2,025.04 feet. (Public Works of Canada datum.)

Channel.—One slightly shifting channel at all stages.

Discharge measurements.—Made from downstream side of bridge with rope, weights and stay line.

Floods.—Largest flood within memory took place in August, 1899, followed by another one, not quite so large, in 1900. On both occasions considerable damage was done, but no actual figures are available.

Winter flow.—From November to April the river is frozen over, and measurements are made at a point about one-half mile below the bridge.

Maximum flow.—In August, 1899, gauge height was 35.45 feet, and the estimated discharge 180,000 sec.-feet.

Minimum flow.—The lowest recorded flow of the stream at this point took place December 24-27, 1913, when the discharge was measured and found to be 650 sec.-feet.

Observer.—Edmonton Lumber Company (per W. H. Schneider).

DISCHARGE MEASUREMENTS of North Saskatchewan River at Edmonton, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 8.....	P. H. Daniells.....	455	1,695	0.80	7.96	1,358
Jan. 28.....	do.....	445	1,539	0.62	7.83	969
Feb. 18.....	do.....	337 ^a	1,671	0.54	8.46	834
Mar. 20.....	do.....	377	1,255	1.01	7.90	1,279
April 6.....	do.....	389	1,324	0.83	7.80	1,142
April 27.....	do.....	411	2,354	1.87	9.19	4,424
May 4.....	G. J. Smith and J. M. Paul..	492	3,255	2.53	10.90	8,233
May 23.....	J. M. Paul.....	536	3,746	2.44	10.95	9,143
June 12.....	do.....	582	6,773	4.68	16.30	31,675
July 6.....	do.....	578	6,343	3.94	15.55	24,976
July 23.....	do.....	562	4,964	3.29	13.18	16,342
Aug. 17.....	do.....	553	3,759	2.87	11.48	10,773
Sept. 1.....	do.....	550	3,543	2.65	10.98	9,406
Sept. 18.....	do.....	408	2,623	2.02	9.30	5,298
Oct. 2.....	do.....	408	2,523	2.01	9.27	5,081
Nov. 4.....	P. H. Daniells.....	382	1,890	1.60	8.14	3,025
Nov. 26.....	do.....	385 ^a	2,200	1.06	8.35	2,322
Dec. 8.....	do.....	238 ^a	1,745	0.45	7.30	782

^a Measured below regular station.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Edmonton, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	7.20	1,280 ^a	7.90	1,075	8.40	975	7.60	1,250	8.90	3,950	9.90	6,520
2.....	7.30	1,300	7.90	1,075	8.40	1,045	7.60	1,075	8.90	3,950	9.60	5,840
3.....	7.70	1,325	8.00	1,000	8.40	1,125	7.60	1,200	9.40	4,860	9.40	5,440
4.....	7.70	1,360	8.00	1,000	8.40	1,100	7.70	1,200	10.10	6,330	10.40	7,810
5.....	7.70	1,400	8.00	1,000	8.40	1,125	7.80	1,225	13.10	15,000 ^c	13.40	17,120
6.....	7.60	1,450	8.00	800	8.20	1,100	7.80	1,185	12.40	12,780	14.80	22,200
7.....	7.80	1,450	8.00	812	8.20	1,075	8.00	1,145	11.60	10,300	16.00	26,760
8.....	7.90	1,400	8.00	825	8.20	1,050	8.00	1,160	11.30	9,650	23.10	37,780
9.....	8.00	1,360	8.00	875	8.10	1,025	8.10	1,175	10.90	8,480	24.00	61,740
10.....	8.10	1,360	8.00	925	8.00	1,000	8.20	1,200	11.00	8,800	21.60	51,180
11.....	8.10	1,285	8.00	925	7.90	1,050	8.20	1,200	11.70	10,820	19.60	42,380
12.....	8.10	1,200	8.00	925	8.00	1,100	8.50	1,250	12.10	12,080	16.80	30,060
13.....	8.00	1,190	8.00	925	8.00	1,050	8.50	1,250 ^a	11.60	10,610	16.10	27,150
14.....	7.90	1,175	8.00	960	8.00	1,125	8.60	1,275 ^b	11.10	9,260	15.60	25,240
15.....	7.80	1,175	8.00	1,000	7.90	1,200	8.90	1,890	10.80	8,400	15.00	22,960
16.....	7.80	1,175	8.00	1,025	7.80	1,150	8.70	2,300	10.90	8,800	15.10	23,340
17.....	7.90	1,175	8.00	975	7.90	1,150	8.70	2,380	11.00	9,140	15.40	24,480
18.....	8.00	1,200	8.40	900	7.90	1,125	9.10	3,570	11.40	10,250	16.00	26,760
19.....	8.00	1,225	8.40	835	7.90	1,175	9.60	4,390	11.00	9,200	16.00	26,760
20.....	8.00	1,225	8.40	835	7.90	1,125	10.00	5,200 ^b	10.90	8,950	15.90	26,380
21.....	8.00	1,185	8.40	800	7.90	1,280	10.10	6,330	11.10	9,500	15.00	22,960
22.....	8.00	1,135	8.40	885	7.90	1,300	10.10	6,330	11.30	10,090 ^c	14.70	21,820
23.....	8.00	1,095	8.40	975	7.90	1,300	10.20	6,570	10.90	9,110	14.60	21,440
24.....	8.00	1,050	8.40	1,035	7.90	1,300	10.00	6,110	11.00	9,370	14.40	20,680
25.....	8.00	1,050	8.40	1,100	7.90	1,100	9.70	5,460	11.00	9,370	14.80	22,200
26.....	8.00	1,075	8.40	1,075	7.90	1,075	9.50	5,060	11.40	10,510	14.00	19,230
27.....	7.90	1,100	8.40	1,050	7.90	1,100	9.20	4,460	11.30	10,210	13.90	18,870
28.....	7.80	1,100	8.40	1,050	7.90	1,137	9.20	4,460	11.00	9,370	13.80	18,510
29.....	7.80	968	.....	.....	7.80	1,175	9.00	4,090	10.60	8,330	13.60	17,800
30.....	7.80	1,075	.....	.....	7.70	1,250	9.00	4,090	10.00	6,770	13.40	17,120
31.....	7.90	1,075	.....	.....	7.60	1,275	.....	.....	10.00	6,770	.....	.....

^a Ice conditions Jan. 1 to April 13.^b Ice breaking up April 14 to April 20; discharges during this period interpolated.^c Shifting conditions May 5 to May 22.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Edmonton, for 1914.

Day.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	14.00	19,230	11.90	12,090	11.00	9,370	9.40	5,440	8.10	2,970	8.70	2,350
2.....	14.40	20,680	12.00	12,410	10.80	8,850	9.20	5,040	8.10	2,970	8.30	2,080
3.....	14.70	21,820	12.50	14,060	10.70	8,590	9.20	5,040	8.10	2,970	8.10	1,850
4.....	14.90	22,580	12.30	13,380	10.60	8,330	9.20	5,040	8.10	2,970	8.30	1,900
5.....	15.20	23,720	12.60	14,400	10.40	7,810	9.20	5,040	8.10	2,970	8.10	1,750
6.....	15.60	25,240	12.60	14,400	10.40	7,810	9.20	5,040	8.10	2,970	7.90	1,500
7.....	15.70	25,620	12.60	14,400	10.30	7,550	9.10	4,840	8.00	2,830	7.30	770
8.....	15.70	25,620	12.00	12,410	10.30	7,550	9.10	4,840	8.00	2,830	7.40	782
9.....	15.10	23,340	12.30	13,380	10.20	7,290	9.30	5,240	7.90	2,690	7.40	790
10.....	15.00	22,960	12.00	12,410	10.50	8,070	9.20	5,040	7.70	2,410	7.40	800
11.....	14.70	21,820	11.50	10,810	10.50	8,070	9.30	5,240	8.10	2,500 ^b	7.40	800
12.....	14.50	21,060	11.00	9,370	10.40	7,810	9.50	5,640	8.00	2,460	7.40	800
13.....	14.20	19,950	10.90	9,110	10.30	7,550	9.60	5,840	8.00	2,450	7.30	755
14.....	14.60	21,440	10.90	9,110	10.20	7,290	9.40	5,440	8.00	2,450	7.20	710
15.....	15.20	23,720	11.00	9,370	10.00	6,770	9.20	5,040	7.90	2,400	7.10	700
16.....	15.20	23,720	11.20	9,920	9.80	6,280	9.10	4,840	7.80	2,320 ^a	7.30	700
17.....	15.00	22,960	11.40	10,510	9.50	5,640	9.00	4,640	7.40	2,145	7.40	765
18.....	14.80	22,200	11.50	10,810	9.30	5,240	9.00	4,640	7.30	2,050	7.40	800
19.....	14.00	19,230	11.40	10,510	9.40	5,440	8.90	4,440	7.40	2,090	7.30	770
20.....	13.60	17,800	11.20	9,920	9.20	5,040	8.90	4,440	7.40	2,100	7.30	750
21.....	13.00	15,760	11.10	9,640	9.10	4,840	8.90	4,440	7.40	2,100	7.30	770
22.....	13.80	18,510	11.50	10,810	9.10	4,840	8.90	4,440	8.00	2,175	7.60	900
23.....	12.20	13,050	11.80	11,770	9.10	4,840	8.70	4,045	8.30	2,250	7.60	950
24.....	12.00	12,410	11.60	11,130	9.10	4,840	8.60	3,855	8.50	2,315	7.65	1,000
25.....	12.00	12,410	11.60	11,130	9.00	4,640	8.50	3,670	8.70	2,400	7.70	1,035
26.....	11.80	11,770	11.30	10,210	8.80	4,240	8.50	3,670	8.35	2,322	7.80	1,070
27.....	11.70	11,450	11.00	9,370	9.00	4,640	8.40	3,490	8.30	2,150	7.80	1,100
28.....	11.60	11,130	11.00	9,370	9.00	4,640	8.30	3,310	8.40	2,335	7.90	1,210
29.....	11.60	11,130	10.80	8,850	9.20	5,040	8.30	3,310	8.70	2,340	8.00	1,330
30.....	11.60	11,130	11.00	9,370	9.60	5,840	8.20	3,130	8.60	2,250	8.00	1,350
31.....	11.90	12,090	11.10	9,640	.....	.....	8.20	3,130	.....	.....	8.00	1,340 ^a

^a Ice conditions Nov. 16 to Dec. 31.^b Ice forming Nov. 11 to Nov. 15; discharges during this period interpolated.

MONTHLY DISCHARGE of North Saskatchewan River at Edmonton, for 1914.

(Drainage area 10,620 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	1,450	968	1,213	0.114	0.13	74,583
February.....	1,100	800	952	0.090	0.09	52,871
March.....	1,300	975	1,134	0.107	0.12	69,728
April.....	6,570	1,075	2,430	0.229	0.26	144,600
May.....	15,000	3,950	9,064	0.854	0.98	557,324
June.....	61,740	5,440	24,618	2.320	2.59	1,464,880
July.....	25,620	11,130	18,889	1.780	2.05	1,161,429
August.....	14,400	9,110	11,099	1.040	1.20	682,439
September.....	9,370	4,240	6,492	0.611	0.68	386,300
October.....	5,840	3,130	4,558	0.429	0.49	280,258
November.....	2,970	2,050	2,473	0.233	0.26	147,157
December.....	2,350	700	1,102	0.104	0.12	67,762
The year.....					8.97	5,089,331

SESSIONAL PAPER No. 25c

PIGEON CREEK AT PIGEON LAKE.

Location.—On SE. $\frac{1}{4}$ Sec. 15, Tp. 46, Rge. 28, W. 4th Mer., at the traffic bridge near outlet of Pigeon Lake, and on the trail from Wetaskiwin to Westeros post office.

Records available.—Discharge measurements only, made during 1912, 1913 and 1914.

Gauge.—Vertical staff, spiked to a post in creek on downstream side of bridge.

Bench-mark.—On a spike in a pile at the southwest corner of the bridge; elevation of bench-mark, 6.64 feet above zero of the gauge.

Channel.—Permanent sand and gravel.

Discharge measurements.—Made by wading near the bridge.

Winter flow.—The creek is partly open all winter, and measurements are made by wading.

Artificial control.—Dam at outlet of lake fitted with two gates and a fishway.

Remarks.—The gauge was established in 1914, but, owing to the construction of the dam, the creek was dry during the months of July, August, September and part of October. As it was difficult to secure a satisfactory observer, no gauge heights were obtained when the creek was opened in October.

DISCHARGE MEASUREMENTS of Pigeon Creek at Pigeon Lake, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 28	J. S. Tempest	11.0	6.55	0.82	.....^a	9.1
Mar. 13	do	13.0	8.25	1.38	.....^a	11.4
July 13	J. M. Paul	30.0	48.40	1.39	4.61	67.0
Aug. 7	do	14.8	5.71	0.73	2.65	Nil ^b
Oct. 23	do	14.8	5.71	0.73	2.82	4.2
Dec. 12	P. H. Daniells	18.0	9.80	1.26	3.06	12.4

^a No gauge.

^b Water standing in pools.

BATTLE RIVER AT PONOKA.

Location.—On the SW. $\frac{1}{4}$ Sec. 4, Tp. 43, Rge. 25, W. 4th Mer., at the steel traffic bridge 300 yards southeast of the C.P.R. depot in the town of Ponoka.

Records available.—May 7, 1913, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 88.31 since establishment.

Bench-mark.—Permanent iron bench-mark located beside outside pile on upstream side of left abutment; assumed elevation, 100.00.

Channel.—Slightly shifting.

Discharge measurements.—Made by wading at a point 300 feet upstream.

Winter flow.—From November to April river is frozen over, and measurements are made at a point 300 feet upstream from bridge.

Observer.—G. R. Edwards.

DISCHARGE MEASUREMENTS of Battle River at Ponoka, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 10.	P. H. Daniels.	15.5a	10.0	0.78	2.51	7.8
Feb. 16.	do	23.0a	23.0	0.64	3.16	14.7
Mar. 23.	do	21.0a	26.8	1.12	3.34	31.0
April 28.	do	68.0	203.0	0.73	3.57	149.0
May 15.	G. J. Smith and J. M. Paul.	70.0	253.0	0.87	4.12	221.0
June 3.	J. M. Paul.	64.0	178.0	0.58	3.04	103.0
June 25.	do	82.5	596.0	1.22	7.04	727.0
July 11.	do	69.0	342.0	0.56	3.93	192.0
Aug. 10.	do	64.0	246.4	0.12	2.65	30.0
Aug. 22.	do	62.0	231.0	0.01	2.34	3.6
Sept. 11.	do	68.0	266.0	0.25	2.85	66.0
Sept. 25.	do	65.5	239.0	0.15	2.55	35.0
Oct. 16.	do	67.0	258.0	0.24	2.84	62.0
Nov. 5.	P. H. Daniels.	66.0	237.0	0.20	2.61	46.0
Nov. 20.	do	23.0a	20.8	1.34	2.51	28.0
Dec. 11.	do	22.0a	26.8	1.26	2.76	34.0

a Measured above regular section.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Ponoka, for 1914.

DAY.	March.		April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			3.08	28	3.27	108	3.08	87	6.03	533
2.			3.07	28	3.26	107	3.05	84	5.65	468
3.			3.09	28	4.86	337	3.02	80	5.26	402
4.			3.13	29	7.54	803	3.12	91	4.97	354
5.			4.00	30	8.37	953	4.41	265	4.74	317
6.			3.97	32	8.99	1,064	5.37	421	4.57	290
7.			4.65	33	10.04	1,253	6.62	638	4.50	279
8.			5.02	34	9.76	1,203	8.55	985	4.35	255
9.			5.13	36	8.66	1,005	10.79	1,388	4.18	229
10.			5.18	37	6.82	674	13.99	1,964	4.04	209
11.			5.25	38	5.58	457	13.62	1,898	3.93	193
12.	3.32	27 ^a	5.27	39	5.06	369	13.01	1,788	3.87	185
13.	3.34	31	5.29	40 ^a	4.64	301	12.65	1,723	3.85	182
14.	3.36	30	5.36	51 ^b	4.47	274	10.90	1,408	3.86	183
15.	3.35	30	5.40	60	4.11	218	9.67	1,187	4.08	214
16.	3.42	30	5.23	72	4.07	213	8.05	895	4.08	214
17.	3.47	29	5.08	83	4.02	206	6.67	647	3.97	199
18.	3.43	29	4.60	91	3.88	186	6.68	648	3.76	169
19.	3.36	28	4.30	99	3.77	171	6.69	650	3.67	157
20.	3.25	27	4.20	104	3.78	172	6.76	663	3.56	143
21.	3.26	27	3.94	120	3.82	178	6.75	661	3.44	129
22.	3.28	31	3.90	136	3.76	169	6.78	666	3.32	114
23.	3.26	31	3.73	148	3.70	161	7.00	706	3.23	104
24.	3.27	31	3.54	161 ^b	3.57	144	7.15	733	3.10	89
25.	3.20	30	3.79	174	3.52	138	7.05	715	3.07	86
26.	3.12	28	3.75	168	3.46	131	6.88	684	3.07	86
27.	3.08	27	3.69	160	3.46	131	6.93	693	3.03	81
28.	3.12	28	3.59	147	3.37	120	6.99	704	2.98	76
29.	3.12	29	3.47	132	3.31	113	6.83	675	2.94	72
30.	3.12	29	3.37	120	3.27	108	6.56	627	2.91	69
31.	3.08	28			3.23	104			2.88	66

a Ice conditions March 12 to April 13.

b Ice breaking up April 14 to 24; discharges estimated.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Ponoka, for 1914.

DAY.	August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.82	60.0	2.29	15.3	2.45	28	2.60	40	2.72	32
2.....	2.76	51.0	2.27	13.9	2.53	34	2.55	36	2.71	31
3.....	2.71	50.0	2.25	12.5	2.55	36	2.58	38	2.68	31
4.....	2.65	44.0	2.23	11.1	2.64	41	2.57	38	2.65	31
5.....	2.61	41.0	2.21	9.7	2.71	50	2.57	40 ^b	2.68	31
6.....	2.57	38.0	2.20	9.0	3.03	81	2.61	46	2.70	32
7.....	2.52	34.0	2.23	11.1	3.05	84	2.57	46	2.68	32
8.....	2.50	32.0	2.29	15.3	3.00	78	2.57	42	2.74	33
9.....	2.53	34.0	2.40	24.0	3.02	80	2.63	39	2.76	34
10.....	2.66	45.0	2.55	36.0	3.03	81	2.57	35	2.74	34
11.....	2.81	59.0	2.78	56.0	3.02	80	2.64	32	2.80	34
12.....	2.76	51.0	2.79	57.0	2.96	74	2.52	29 ^b	2.78	34
13.....	2.70	49.0	2.76	54.0	2.89	67	2.56	28 ^a	2.78	34
14.....	2.69	48.0	2.72	51.0	2.85	63	2.56	28	2.77	34
15.....	2.67	46.0	2.70	49.0	2.82	60	2.51	27	2.78	34
16.....	2.62	42.0	2.67	46.0	2.83	61	2.54	27	2.78	34
17.....	2.60	40.0	2.65	44.0	2.82	60	2.56	28	2.77	34
18.....	2.63	43.0	2.62	42.0	2.80	58	2.61	29	2.78	34
19.....	2.60	40.0	2.60	40.0	2.75	54	2.56	28	2.76	33
20.....	2.55	36.0	2.60	40.0	2.70	49	2.57	28	2.77	34
21.....	2.50	32.0	2.64	44.0	2.67	46	2.60	28	2.77	34
22.....	2.33	18.4	2.60	40.0	2.65	44	2.56	28	2.83	35
23.....	2.33	18.4	2.59	39.0	2.63	43	2.61	30	2.87	33
24.....	2.33	18.4	2.55	36.0	2.63	43	2.59	29	2.89	32
25.....	2.32	17.6	2.55	36.0	2.62	42	2.59	29	2.90	31
26.....	2.32	17.6	2.52	34.0	2.61	41	2.58	29	2.94	30
27.....	2.35	20.0	2.49	31.0	2.61	41	2.62	29	2.94	31
28.....	2.33	18.4	2.46	29.0	2.61	41	2.62	30	2.96	32
29.....	2.32	17.6	2.45	28.0	2.61	41	2.66	31	2.96	32
30.....	2.34	19.2	2.45	28.0	2.63	43	2.73	32	2.96	32
31.....	2.31	16.8	.....	.....	2.65	44	.....	.....	3.01	32 ^a

^a Ice conditions Nov. 13 to Dec. 31.^b Ice forming Nov. 5 to 12; discharges estimated.

MONTHLY DISCHARGE of Battle River at Ponoka, for 1914.

(Drainage area 670 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	14	6.1	9.7	0.014	0.02	596
February.....	15	5.0	11.0	0.016	0.02	611
March.....	31	12.1	25.0	0.037	0.04	1,537
April.....	174	28.0	82.0	0.122	0.14	4,879
May.....	1,253	104.0	373.0	0.557	0.64	22,935
June.....	1,964	80.0	812.0	1.210	1.35	48,317
July.....	533	66.0	198.0	0.296	0.34	12,175
August.....	60	16.8	36.0	0.054	0.06	2,214
September.....	57	9.0	33.0	0.049	0.06	1,964
October.....	84	28.0	54.0	0.081	0.09	3,320
November.....	46	27.0	33.0	0.049	0.06	1,964
December.....	35	30.0	33.0	0.049	0.06	2,029
The year.....	.....	.....	.....	.....	2.88	102,541

NOTE.—Discharges for Jan., Feb. and March estimated, as no gauge heights were obtained previous to March 12.

BATTLE RIVER AT BATTLEFORD (UPPER STATION).

Location.—On NW. $\frac{1}{4}$ Sec. 25, Tp. 43, Rge. 17, W. 3rd. Mer., at the traffic bridge about one-half mile west of the Canadian Northern Railway station at Battleford.

Records available.—May 23, 1914, to October 31, 1914.

Gauge.—Chain gauge at chainage 200 feet on bridge; gauge zero maintained at elevation 83.89 feet.

Bench-mark.—On top of abutment, downstream side of west end of bridge; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge.

Winter flow.—No winter observations have been taken, as the lower station is maintained.

Observer.—H. Saunders.

Remarks.—This station was established to obtain records of gauge height not affected by backwater from the North Saskatchewan River, and during 1914 proved very satisfactory.

DISCHARGE MEASUREMENTS of Battle River at Battleford (Upper Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
June 21.....	W. H. Storey.....	206	1035	2.76	7.37	2,860
July 22.....	do.....	199	560	2.64	5.40	1,475
Aug 18.....	do.....	121	226	2.1	3.38	475
Oct 15.....	F. R. Steinberger.....	192	348	2.12	4.10	737

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Battleford (Upper Station), for 1914.

DAY.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	4.55	956	7.35	2,842	4.42	889	3.19	414	3.07	381		
2.....	4.45	905	7.33	2,828	4.36	859	3.13	398	3.05	375		
3.....	4.45	905	7.30	2,806	4.28	821	3.12	395	3.03	370		
4.....	4.43	894	7.28	2,792	4.25	807	3.11	392	3.09	386		
5.....	4.34	850	7.24	2,763	4.14	756	3.10	389	3.28	440		
6.....	4.24	801	7.20	2,734	4.06	721	3.14	400	3.31	449		
7.....	4.14	756	7.14	2,691	3.98	687	3.17	409	3.46	495		
8.....	4.12	747	7.08	2,648	3.95	674	3.16	406	3.45	492		
9.....	4.08	729	6.99	2,583	3.86	638	3.17	409	3.43	486		
10.....	4.01	699	6.89	2,511	3.81	619	3.15	403	3.49	505		
11.....	4.58	972	6.75	2,411	3.80	615	3.13	398	3.48	502		
12.....	4.49	925	6.72	2,380	3.77	604	3.15	403	3.59	539		
13.....	4.57	967	6.61	2,311	3.72	585	3.14	400	4.16	755		
14.....	4.82	1,107	6.49	2,226	3.69	574	3.10	389	4.18	774		
15.....	5.18	1,329	6.36	2,133	3.64	556	3.12	395	4.10	738		
16.....	5.45	1,504	6.24	2,048	3.62	549	3.12	395a	3.93	666		
17.....	5.43	1,491	6.13	1,971	3.59	539	3.11	392	3.87	642		
18.....	5.38	1,458	6.02	1,894	3.51	511	3.11	392	3.70	578		
19.....	5.53	1,557	5.89	1,803	3.49	505	3.10	389	3.58	535		
20.....	5.60	1,604	5.81	1,748	3.44	489	3.11	392	3.56	528		
21.....	5.68	1,658	5.67	1,651	3.41	479	3.10	389	3.52	515		
22.....	5.96	1,852	5.47	1,517	3.40	476	3.10	389	3.47	498		
23.....	5.67	1,652	5.37	1,441	3.49	505	3.10	389	3.42	482		
24.....	5.58	1,591	5.28	1,393	3.40	476	3.09	386	3.37	467		
25.....	5.54	1,564	5.14	1,303	3.35	461	3.09	386	3.35	461		
26.....	5.35	1,438	5.02	1,228	3.36	464	3.09	386	3.37	467		
27.....	5.38	1,458	4.91	1,160	3.34	458	3.09	386	3.34	458		
28.....	5.14	1,304	4.77	1,078	3.27	437	3.08	384	3.31	449		
29.....	4.93	1,172	4.66	1,016	3.26	434	3.08	384b	3.29	443		
30.....	4.95	1,184	4.58	972	3.24	430	3.08	384	3.32	452		
31.....	4.55	956	4.51	935	3.23	426	.....	.....	3.30	446c		

a to b Interpolated. Observer ill.

c Observations discontinued from Oct. 31.

SESSIONAL PAPER No. 25c

MONTHLY DISCHARGE of Battle River at Battleford (Upper Station), for 1914.

(Drainage area 11,850 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (23-31).....	1,652	956	1,369	0.116	0.0390	24,428
June.....	2,950	699	1,550	0.131	0.1460	92,230
July.....	2,842	935	1,995	0.170	0.1960	122,660
August.....	889	426	582	0.049	0.0560	35,786
September.....	414	384	394	0.033	0.0370	23,415
October.....	774	370	509	0.043	0.0499	31,297
The period.....					0.5239	329,846

BATTLE RIVER AT BATTLEFORD (LOWER STATION).

Location.—On SE. $\frac{1}{4}$ Sec. 19, Tp. 43, Rge. 16, W. 3rd Mer.*Records available.*—June 17, 1911, to December 31, 1914.*Gauge.*—Vertical staff. Zero of gauge was maintained at 71.95 feet during 1911-12.*Chain.*—Zero of gauge was maintained at 72.53 feet during 1913-14.*Bench-mark.*—On top of left abutment on outer downstream corner; assumed elevation, 100.00 feet.*Channel.*—Sand, which is subject to shift. River also is liable to backwater effect from North Saskatchewan River.*Discharge measurements.*—From bridge at gauge.*Observer.*—C. J. Johnson.

DISCHARGE MEASUREMENTS of Battle River at Battleford (Lower Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 8.....	F. R. Steinberger.....	67.0	91.5	0.28	4.34	26.0
Jan. 29.....	do.....	88.0	48.8	0.60	4.50	29.3
Feb. 16-17.....	do.....	36.0	58.4	0.34	4.80	19.9
Mar 6.....	do.....	31.0	54.6	0.38	4.79	21.0
April 14.....	do.....	134.0	184.0	0.83	4.62	171.0
May 21.....	W. H. Storey.....	198.0	658.0	2.71	6.04	1,858.0
June 26.....	do.....	a			7.42	2,859.0
July 22.....	do.....	a			6.00	1,475.0
Aug. 18.....	do.....	a			4.28	475.0
Oct. 15.....	F. R. Steinberger.....	a			4.89	737.0
Nov. 28.....	do.....	101.0	186.0	0.99	4.41	184.0
Dec. 15.....	do.....	109.0	184.9	1.07	4.53	197.0

a Measurements made at upper station.

DAILY GAUGE HEIGHT AND DISCHARGE OF Battle River at Battleford (Lower Station),
for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	4.15	39 ^c	4.54	24	4.96	21	4.67	37	4.95	1,000	5.09	1,020
2.....	4.17	38	4.57	23	4.91	21	4.66	40	4.97	1,015	5.04	990
3.....	4.17	37	4.57	23	4.93	21	4.66	45	4.99	1,035	5.02	970
4.....	4.20	35	4.59	22	5.07	21	4.65	50	4.94	1,000	4.96	930
5.....	4.21	33	4.59	22	4.87	21	4.66	57	4.83	935	4.86	870
6.....	4.24	30	4.60	21	4.91	21	4.66	64	4.77	900	4.84	855
7.....	4.29	28	4.61	21	4.90	21	4.67	73	4.70	855	4.81	835
8.....	4.33	26	4.64	21	4.88	22	4.67	82	4.61	805	4.76	785
9.....	4.33	24	4.66	21	4.86	22	4.67	95	4.80	910	4.72	770
10.....	4.35	24	4.66	21	4.86	22	4.70	108	5.37	1,290	4.72	760
11.....	4.35	25	4.69	21	4.85	22	4.65	123	6.16	1,970	7.88	3,630
12.....	4.37	27	4.70	21	4.76	22	4.65	138	6.14	1,950	7.32	2,950
13.....	4.39 ^d	29	4.72	20	4.74	22	4.65	154	6.02	1,840	6.28	1,840
14.....	4.40	30	4.74	20	4.70	22	4.63	171	6.00	1,820	5.67	1,320
15.....	4.41	30	4.80	20	4.65	22	4.61	200 ^a	6.00	1,820	5.50	1,160
16.....	4.41	30	4.73	20	4.57	21	4.56	300	6.00	1,820	5.79	1,395
17.....	4.41	29	4.80	20	4.61	21	4.55	400	6.00	1,820	5.96	1,520
18.....	4.42	28	4.80	20	4.57	20	4.51	500	6.00	1,820	5.76	1,350
19.....	4.44	28	4.84	20	4.51	21	4.41	600	5.98	1,795	5.76	1,340
20.....	4.45	27	4.84	20	4.54	21	3.85	700	6.04	1,840	5.80	1,560
21.....	4.46	26	4.86	21	4.45	21	3.96	800	6.06	1,858	5.96	1,480
22.....	4.47	26	4.87	21	4.45	21	5.03	1,071 ^{b,c}	5.98	1,800	6.16	1,620
23.....	4.48 ^d	26	4.87	21	4.47	21	5.00	1,040	5.89	1,710	6.40	1,840
24.....	4.49	27	4.86	21	4.57	21	4.91	998	5.82	1,640	6.68	2,100
25.....	4.50	28	4.87	21	4.58	21	4.60	805	5.74	1,560	7.11	2,530
26.....	4.50	28	4.88	21	4.58	22	4.50	755	5.68	1,500	7.44	2,850
27.....	4.50	29	4.93	21	4.70	23	4.75	890	5.55	1,380	7.38	2,827
28.....	4.51	29	4.95	21	4.71	25	5.01	1,045	5.43	1,290	7.36	2,805
29.....	4.50	29	.....	.....	4.76	27	4.98	1,030	5.26	1,160	7.39	2,839
30.....	4.53	28	.....	.....	4.80	30	4.95	1,005	5.18	1,100	7.40	2,850
31.....	4.54	26	.....	.....	4.71	33	.....	.....	5.12	1,055	.....	.....

^a to ^b Ice broken up and going out.^c Ice conditions Jan. 1 to April 22.^d Gauge heights interpolated Jan. 13-23.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Battle River at Battleford (Lower Station),
for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	7.42	2,873	4.96	770	4.12	417	3.91	348	4.16	431	4.46	190
2.....	7.40	2,850	4.92	750	4.10	410	3.94	357	4.16	431	4.48	189
3.....	7.39	2,839	4.87	725	4.08	403	3.96	363	4.14	424	4.51	188
4.....	7.39	2,839	4.84	710	4.07	400	4.15	427	4.11	414	4.51	187
5.....	7.35	2,793	4.80	690	4.06	396	4.23	455	4.11	413	4.51	186
6.....	7.31	2,748	4.74	663	4.05	392	4.30	480	4.10	410	4.52	186
7.....	7.26	2,693	4.69	640	4.16	431	4.32	487	4.16	431	4.52	187
8.....	7.22	2,649	4.64	618	4.15	427	4.30	480	4.18	438	4.52	191
9.....	7.17	2,594	4.58	591	4.12	417	4.30	480	4.13	420	4.53	194
10.....	7.08	2,495	4.55	578	4.08	403	4.30	480	4.10	410	4.53	194
11.....	7.02	2,429	4.51	560	4.05	392	4.34	494	4.06	396	4.53	194
12.....	6.93	2,322	4.47	543	4.08	403	4.39	512	4.05	392	4.54	195
13.....	6.83	2,262	4.44	531	4.35	497	4.81	695	4.00	375	4.56	195
14.....	6.73	2,125	4.46	539	4.41	519	4.94	760	3.98	390c	4.56	196
15.....	6.62	2,019	4.47	543	4.39	512	4.89	735	4.00	240	4.53	197
16.....	6.54	1,943	4.42	523	4.40	515	4.74	663	4.03	175	4.53	199
17.....	6.42	1,829	4.34	494	4.34	494	4.62	609	4.03	167	4.53	204
18.....	6.32	1,738	4.28	473	4.25	463	4.52	564	4.08	171	4.53	204
19.....	6.22	1,652	4.28	473	4.18	438	4.47	513	4.17	178	4.52	193
20.....	6.14	1,584	4.34	494	4.14	424	4.42	523	4.23	185	4.52	178
21.....	6.03	1,494	4.30	480	4.12	417	4.39	511	4.30	192	4.52	156
22.....	5.96	1,438	4.27	469	4.10	410	4.35	497	4.34	186	4.52	138
23.....	5.86	1,358	4.25	463	4.06	396	4.32	487	4.37	180	4.52	117
24.....	5.74	1,265	4.24	459	4.03	385	4.30	480	4.40	185	4.52	100
25.....	5.62	1,179	4.22	452	4.02	382	4.24	459	4.46	190	4.52	93
26.....	5.52	1,109	4.20	445	4.02	382	4.20	445	4.43	184	4.52	96
27.....	5.38	1,018	4.20	445	3.98	369	4.20	445	4.41	176	4.52	108
28.....	5.24	934	4.18	438	3.94	357	4.19	441	4.41	184	4.51	109
29.....	5.14	874	4.16	431	3.93	354	4.19	441	4.41	189	4.51	104
30.....	5.06	826	4.14	424	3.92	351	4.18	438	4.41	191	4.51	106
31.....	5.00	790	4.13	420			4.16	431			4.54	117c

c Ice conditions Nov. 14 to Dec. 31.

MONTHLY DISCHARGE of Battle River at Battleford (Lower Station), for 1914.

(Drainage area 11,850 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	39	24	29	0.0024	0.003	1,753
February.....	24	20	21	0.0018	0.002	1,166
March.....	33	20	22	0.0019	0.002	1,533
April.....	1,071	37	446	0.0376	0.046	26,339
May.....	1,970	805	1,429	0.1210	0.140	87,868
June.....	3,630	760	1,680	0.1420	0.160	99,970
July.....	2,873	790	1,920	0.1620	0.190	118,060
August.....	770	420	543	0.0458	0.050	33,388
September.....	519	351	419	0.0345	0.040	24,932
October.....	760	348	501	0.0423	0.050	30,805
November.....	438	167	289	0.0244	0.030	17,197
December.....	204	93	164	0.0140	0.020	10,084
The year.....					0.727	453,145

NORTH SASKATCHEWAN RIVER AT BATTLEFORD.

Location.—North channel: SW. $\frac{1}{4}$ Sec. 33, Tp. 43, Rge. 16, W. 3rd Mer. South channel: NE. $\frac{1}{4}$ Sec. 29, Tp. 43, Rge. 16, W. 3rd Mer.

Records available.—May 16, 1911, to December 31, 1914.

Gauges.—North channel: Chain; elevation of zero maintained at 1,512.30 feet since establishment. South channel: Chain; elevation of zero maintained at 1,511.88 feet since establishment.

Bench-marks.—North channel: On downstream side of left abutment; elevation 1,525.66 feet above mean sea level (Department of Public Works, Canada). South channel: Permanent iron bench-mark on right bank; elevation, 1,530.72 feet above mean sea level (Department of Public Works, Canada).

Channel.—Shifts considerably at high stages.

Discharge measurements.—From bridge.

Observer.—Harold W. Fisher.

DISCHARGE MEASUREMENTS of North Channel of North Saskatchewan River,
at Battleford, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 7.....	F. R. Steinberger.....	201	719	0.18	2.60	130
Jan. 24-26.....	do.....	196	671	0.29	3.29	194
Feb. 13.....	do.....	185	502	0.21	3.36	108
Mar. 4.....	do.....	180	535	0.37	3.62	194
April 10-11.....	do.....	565	783	0.66	3.54	515
May 22.....	W. H. Storey.....	748	2,212	2.19	4.36	4,848
June 27-29.....	do.....	1,132	5,773	2.95	7.58	17,062
July 23.....	do.....	985	3,924	2.74	6.05	10,778
Aug. 24.....	do.....	793	2,345	2.50	4.83	5,885
Oct. 16.....	F. R. Steinberger.....	592	1,444	1.57	3.50	2,267
Nov. 26.....	do.....	214	831	0.93	2.73	776
Dec. 16.....	do.....	208	666	0.36	2.25	241

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DAILY GAUGE HEIGHT AND DISCHARGE of North Channel of North Saskatchewan River
at Battleford, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.97	360 ^a	3.31	175	3.61	195	3.67	220	4.17	3,973	4.84	6,062
2.....	2.94	340	3.26	170	3.57	195	3.68	245	3.94	3,328	4.54	5,098
3.....	2.91	315	3.25	165	3.56	195	3.67	275	3.66	2,618	4.15	3,784
4.....	2.87	270	3.22	160	3.59	195	3.64	310	3.54	2,384	3.89	3,196
5.....	2.77	210	3.22	150	3.63	195	3.67	345	3.64	2,602	3.78	2,932
6.....	2.64	150	3.22	145	3.63	195	3.68	375	3.59	2,489	3.38	2,074
7.....	2.61	130	3.21	135	3.62	190	3.68	400	3.57	2,447	4.14	3,886
8.....	2.56	125	3.21	130	3.59	190	3.66	435	3.97	3,402	4.71	5,642
9.....	2.51	120	3.21	120	3.59	190	3.66	470	6.31	11,672	6.94	14,362
10.....	2.38	120	3.16	115	3.58	190	3.65	505	6.04	10,564	11.69	36,024
11.....	2.36	120	3.16	110	3.59	190	3.59	515	5.73	9,320	11.99	37,404
12.....	2.36	125	3.31	110	3.62	195	3.59	600 ^b	5.24	7,464	11.09	33,264
13.....	2.39	130	3.34	110	3.60	200	3.58	700	5.14	7,104	10.74	31,654
14.....	2.46	140	3.39	120	3.57	200	3.56	800	5.02	6,672	9.74	27,054
15.....	2.61	150	3.46	145	3.57	200	3.47	900	4.87	6,161	8.92	23,282
16.....	2.76	160	3.54	170	3.57	200	3.29	1,000	5.24	7,464	8.39	20,844
17.....	2.89	170	3.54	180	3.57	190	3.24	1,100	5.09	6,924	8.22	20,062
18.....	2.86	180	3.54	180	3.57	185	3.16	1,200	4.96	6,464	8.04	19,234
19.....	2.83	185	3.54	180	3.59	175	2.99	1,400 ^b	4.89	6,227	7.84	18,314
20.....	2.81	190	3.54	180	3.56	160	2.96	1,600 ^a	4.76	5,802	7.67	17,548
21.....	2.81	190	3.54	180	3.56	150	3.20	1,770	4.53	5,258	7.59	17,196
22.....	2.86	195	3.56	180	3.56	150	3.29	1,714	4.63	5,386	7.94	18,774
23.....	2.88	195	3.56	180	3.57	150	3.49	2,281	4.84	6,062	8.17	19,832
24.....	2.98	195	3.61	185	3.59	150	3.94	3,324	4.69	5,578	7.94	18,774
25.....	3.25	190	3.64	190	3.59	155	4.35	4,510	4.58	5,226	7.74	17,860
26.....	3.25	190	3.61	190	3.59	160	5.79	9,560	4.78	5,866	7.70	17,680
27.....	3.26	190	3.62	190	3.58	165	5.31	7,716	4.69	5,578	7.63	17,372
28.....	3.26	190	3.62	195	3.59	170	5.13	7,068	4.60	5,290	7.45	16,580
29.....	3.29	185	.....	.....	3.63	180	4.83	6,029	4.54	5,098	7.32	16,008
30.....	3.32	185	.....	.....	3.63	190	4.49	4,939	4.45	4,676	7.08	14,964
31.....	3.35	180	.....	.....	3.63	200	.....	.....	4.44	4,784	.....	.....

^a Ice conditions Jan. 1 to April 20.^b to ^b Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of North Channel of North Saskatchewan River
at Battleford, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	7.14	15,242	5.01	6,636	4.48	4,908	2.95	1,415	2.87	1,314	2.81	746
2.....	7.42	16,448	5.16	7,176	4.31	4,390	2.99	1,467	2.88	1,326	2.84	738
3.....	7.34	16,096	5.04	6,744	4.23	4,150	3.01	1,494	2.85	1,290	2.84	732
4.....	7.23	15,612	4.99	6,566	4.33	4,450	3.23	1,818	2.80	1,230	2.98	745
5.....	5.96	10,240	4.94	6,396	4.23	4,150	3.41	2,129	2.70	1,120	2.99	745
6.....	6.10	10,810	4.89	6,227	4.11	3,799	3.49	2,281	2.70	1,120	2.84	738
7.....	7.20	15,480	4.99	6,566	4.03	3,567	3.51	2,321	2.65	1,070	2.84	660
8.....	7.37	16,228	5.08	6,888	3.98	3,428	3.53	2,363	2.60	1,020	2.79	610
9.....	7.60	17,240	5.18	7,248	3.90	3,220	3.49	2,281	2.55	970	2.74	540
10.....	7.76	17,950	5.57	8,683	3.90	3,220	3.44	2,186	2.50	920	2.67	480
11.....	7.87	18,452	5.43	8,151	3.88	3,172	3.38	2,074	2.50	920	2.49	426
12.....	7.93	18,728	5.23	7,428	3.85	3,100	3.33	1,984	2.45	880	2.43	380
13.....	7.84	18,314	5.20	7,320	3.87	3,148	3.28	1,898	2.43	864	2.39	340
14.....	6.95	14,319	5.08	6,888	3.87	3,148	3.26	1,866	2.40	840	2.34	300
15.....	6.30	12,470	5.07	6,852	3.95	3,350	3.45	2,205	2.40	840	2.34	260
16.....	6.51	12,513	5.02	6,672	4.06	3,654	3.45	2,205	2.37	816	2.29	241
17.....	6.63	13,029	4.38	4,600	4.08	3,712	3.55	2,405	2.35	800	2.14	270
18.....	6.94	14,362	4.37	4,570	3.79	2,956	3.56	2,426	2.35	800	2.12	380
19.....	6.90	14,190	4.33	4,450	3.65	2,625	3.48	2,262	2.35	800	2.09	340
20.....	7.18	15,394	4.32	4,420	3.52	2,342	3.28	1,898	2.55	970	2.04	300
21.....	7.14	15,222	4.61	5,322	3.42	2,148	3.36	2,038	2.57	990	2.00	280
22.....	6.85	13,975	4.78	5,866	3.32	1,966	3.26	1,866	2.60	1,020	1.99	260
23.....	6.10	10,810	4.80	5,930	3.22	1,802	3.15	1,695	2.65	1,070	1.96	250
24.....	5.80	9,600	4.76	5,802	3.16	1,710	3.10	1,620	2.70	1,020 ^a	1.94	245
25.....	5.76	9,440	4.46	4,846	3.12	1,650	3.02	1,508	2.75	975	1.91	145
26.....	5.75	9,400	4.51	5,002	3.10	1,620	3.00	1,480	2.76	776	1.92	152
27.....	5.86	9,840	4.56	5,162	3.05	1,550	2.98	1,454	2.76	790	1.89	180
28.....	5.35	7,860	4.57	5,194	3.04	1,536	2.95	1,415	2.76	816	1.91	188
29.....	5.10	6,960	4.62	5,354	3.08	1,592	2.93	1,389	2.78	892	1.94	180
30.....	4.95	6,430	4.66	5,482	2.94	1,402	2.90	1,350	2.80	770	1.99	180
31.....	5.03	6,708	4.58	5,226	.....	.....	2.90	1,350	.....	.....	2.00	200 ^a

^a Ice conditions Nov. 24 to Dec. 31.

MONTHLY DISCHARGE of North Channel of North Saskatchewan River at Battleford, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	
January.....	360	120	186	11,437
February.....	195	110	158	8,775
March.....	200	150	182	11,191
April.....	9,560	220	444	26,420
May.....	11,672	2,384	5,609	344,888
June.....	37,404	2,074	16,892	1,002,428
July.....	18,728	6,430	13,205	811,910
August.....	8,683	4,420	6,118	376,178
September.....	4,908	1,402	2,916	173,514
October.....	2,426	1,350	1,876	115,352
November.....	1,326	770	968	57,600
December.....	746	145	394	24,226
The year.....				2,963,919

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DISCHARGE MEASUREMENTS of South Channel of North Saskatchewan River at Battleford, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per Sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 8.....	F. R. Steinberger.....	318	915	0.85	3.42	780
Jan. 27-28.....	do	281	978	1.19	4.05	1,172
Feb. 14-16.....	do	270	871	1.21	4.33	1,055
Mar. 5.....	do	267	765	1.52	4.49	1,167
April 11-12.....	do	309	837	1.15	4.08	959
May 23.....	W. H. Storey.....	466	2,418	2.75	5.54	6,649
June 29.....	do	506	4,670	3.22	8.42	15,031
July 24.....	do	496	4,584	2.19	7.17	10,060
Aug. 25.....	do	457	3,795	1.78	5.64	6,749
Oct. 17.....	F. R. Steinberger.....	452	3,356	1.62	4.95	5,425
Nov. 27.....	do	142	1,128	1.40	3.85	1,580
Dec. 17.....	do	137	960	1.33	3.90	1,279

DAILY GAUGE HEIGHT AND DISCHARGE of South Channel of North Saskatchewan River at Battleford, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.66	1,700 ^a	4.24	1,000	4.51	1,120	4.51	1,010	5.10	5,700	5.80	7,140
2.....	3.66	1,550	4.20	945	4.51	1,160	4.49	1,000	4.87	5,279	5.52	6,542
3.....	3.65	1,420	4.15	920	4.52	1,165	4.43	990	4.59	4,814	5.17	5,833
4.....	3.62	1,280	4.14	900	4.52	1,165	4.39	980	4.45	4,595	5.05	5,605
5.....	3.56	1,160	4.24	895	4.47	1,165	4.39	975	4.50	4,670	4.97	5,456
6.....	3.51	1,020	4.21	890	4.47	1,165	4.29	970	4.55	4,750	4.55	4,750
7.....	3.41	900	4.16	890	4.45	1,160	4.29	960	4.52	4,702	5.20	5,890
8.....	3.35	780	4.11	895	4.45	1,150	4.27	960	5.05	5,605	5.85	7,250
9.....	3.33	730	4.06	900	4.43	1,130	4.24	955	6.90	9,880	7.75	12,295
10.....	3.25	720	4.08	910	4.43	1,125	4.19	955	6.63	9,288	12.30	25,930
11.....	3.25	705	4.08	940	4.48	1,135	4.11	955	6.35	8,455	12.60	26,830
12.....	3.25	705	4.12	980	4.53	1,150	4.14	960	6.09	7,590	11.75	24,280
13.....	3.27	715	4.22	1,020	4.53	1,150	4.15	980	5.92	7,406	11.00	22,030
14.....	3.34	745	4.28	1,045	4.53	1,150	4.15	995 ^b	5.80	7,140	10.38	20,170
15.....	3.45	800	4.34	1,050	4.54	1,150	4.05	1,010	5.65	6,815	9.76	18,310
16.....	3.67	890	4.42	1,050	4.53	1,150	4.05	1,400	5.95	7,475	9.34	17,050
17.....	3.80	960	4.55	1,045	4.53	1,150	4.00	2,100	5.80	7,140	9.17	16,540
18.....	3.75	940	4.55	1,030	4.53	1,150	3.92	2,800	5.70	6,920	8.97	15,940
19.....	3.70	925	4.55	980	4.48	1,145	3.68	3,300	5.60	6,710	8.76	15,310
20.....	3.70	925	4.37	960	4.39	1,130	3.71	3,622 ^{ab}	5.52	6,542	8.51	14,560
21.....	3.75	930	4.37	955	4.36	1,110	4.09	4,107	5.30	6,090	8.44	14,350
22.....	3.76	940	4.37	955	4.38	1,090	4.17	4,211	5.56	6,626	8.85	15,580
23.....	3.80	950	4.42	965	4.39	1,080	4.35	4,450	5.76	7,052	9.09	16,300
24.....	3.84	975	4.47	975	4.39	1,065	4.95	5,420	5.60	6,710	8.86	15,610
25.....	3.88	1,020	4.50	1,000	4.41	1,060	5.30	6,090	5.56	6,626	8.70	15,130
26.....	3.92	1,100	4.50	1,035	4.44	1,055	6.70	9,340	5.62	6,752	8.50	14,530
27.....	3.94	1,165	4.52	1,060	4.44	1,055	6.18	8,030	5.57	6,647	8.30	13,930
28.....	3.99	1,175	4.52	1,090	4.43	1,050	6.00	7,590	5.50	6,590	8.30	13,930
29.....	4.04	1,175	.....	.....	4.44	1,045	5.70	6,920	5.47	6,437	8.38	14,170
30.....	4.05	1,150	.....	.....	4.49	1,035	5.41	6,311	5.45	6,395	8.12	13,390
31.....	4.10	1,070	.....	.....	4.54	1,025	.....	.....	5.45	6,395	.....	.....

^a Ice conditions Jan. 1 to April 20.^b to ^b Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of South Channel of North Saskatchewan River at Battleford, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	8.20	13,630	6.35	8,455	5.66	6,836	4.60	4,830	4.20	4,250	4.16	1,515
2.....	8.35	14,080	6.50	8,830	5.51	6,521	4.63	4,878	4.19	4,237	4.19	1,508
3.....	8.29	13,900	6.00	7,590	5.40	6,290	4.70	4,990	4.19	4,237	4.19	1,504
4.....	8.20	13,630	6.01	7,614	5.45	6,395	4.80	5,160	4.10	4,120	4.31	1,500
5.....	7.91	12,760	6.05	7,710	5.37	6,230	4.91	5,348	4.05	4,055	4.31	1,495
6.....	8.10	13,330	6.06	7,731	5.35	6,190	4.95	5,420	4.02	4,016	4.26	1,485
7.....	8.30	13,930	6.17	8,005	5.25	5,990	4.95	5,420	4.00	3,990	4.26	1,470
8.....	8.47	14,440	6.25	8,205	5.20	5,890	4.96	5,438	3.90	3,860	4.21	1,450
9.....	8.70	15,130	6.35	8,435	5.15	5,795	4.92	5,366	3.85	3,795	4.19	1,430
10.....	8.80	15,430	6.50	8,830	5.20	5,890	4.90	5,330	3.70	3,610	4.16	1,410
11.....	8.85	15,580	6.35	8,455	5.20	5,890	4.79	5,143	3.58	3,466	4.11	1,390
12.....	8.90	15,730	6.25	8,205	5.25	5,990	4.70	4,990	3.55	3,430	4.09	1,370
13.....	8.81	15,460	6.22	8,130	5.20	5,890	4.68	4,958	3.51	3,382	4.09	1,345
14.....	8.11	13,360	6.25	8,205	5.18	5,852	4.65	4,910	3.45	3,315	4.11	1,310
15.....	7.78	12,382	6.27	8,255	5.25	5,990	4.62	4,862	3.45	3,315	4.11	1,290
16.....	7.80	12,440	6.21	8,105	5.37	6,230	5.01	5,529	3.42	3,282	4.09	1,275
17.....	7.97	12,940	5.57	6,647	5.39	6,270	5.11	5,719	3.40	3,260	4.03	1,279
18.....	8.40	14,230	5.55	6,605	5.14	5,776	5.12	5,738	3.42	3,282	4.01	1,315
19.....	8.33	14,020	5.50	6,500	5.00	5,510	5.04	5,586	3.45	3,315	3.97	1,318
20.....	8.17	13,540	5.43	6,353	4.87	5,279	4.84	5,228	3.55	3,430	3.93	1,290
21.....	8.10	13,330	5.70	6,920	4.80	5,160	4.92	5,366	3.60	3,490	3.91	1,260
22.....	7.78	12,382	5.92	7,406	4.73	5,041	4.82	5,194	3.65	3,550	3.87	1,240
23.....	7.25	10,845	5.85	7,250	4.71	5,007	4.81	5,177	3.70	3,010a	3.86	1,190
24.....	7.13	10,504	5.78	7,096	4.68	4,958	4.66	4,926	3.75	2,760	3.81	1,150
25.....	7.11	10,448	5.60	6,710	4.65	4,910	4.60	4,830	3.80	2,430	3.79	1,120
26.....	7.10	10,420	5.65	6,815	4.65	4,910	4.50	4,670	3.85	1,890	3.80	1,118
27.....	7.14	10,532	5.70	6,920	4.63	4,878	4.42	4,550	3.87	1,580	3.81	1,116
28.....	6.77	9,529	5.73	6,986	4.63	4,878	4.36	4,464	3.90	1,480	3.81	1,120
29.....	6.51	8,855	5.78	7,096	4.65	4,910	4.30	4,380	4.00	1,562	3.83	1,140
30.....	6.32	8,380	5.82	7,184	4.60	4,830	4.27	4,341	4.05	1,530	3.86	1,250
31.....	6.40	8,580	5.74	7,008	.....	.....	4.25	4,315	.....	.....	3.86	1,400a

a Ice conditions Nov. 23 to Dec. 31.

MONTHLY DISCHARGE of South Channel of North Saskatchewan River at Battleford, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	
January.....	1,700	705	1,007	61,916
February.....	1,090	890	974	54,093
March.....	1,165	1,025	1,117	68,684
April.....	9,340	955	3,012	179,228
May.....	9,880	4,595	6,571	404,590
June.....	26,830	4,750	17,488	1,040,592
July.....	15,730	8,380	12,702	781,022
August.....	8,830	6,353	7,557	464,664
September.....	6,836	4,830	5,673	337,567
October.....	5,738	4,315	5,066	311,496
November.....	4,250	1,480	3,231	192,259
December.....	1,515	1,116	1,324	81,408
The year.....	3,977,519

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MONTHLY DISCHARGE of North Saskatchewan River at Battleford, for 1914.

(Drainage area 27,100a square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	2,060	825	1,193	0.044	0.05	73,353
February.....	1,285	1,020	1,132	0.042	0.04	62,868
March.....	1,360	1,215	1,299	0.048	0.06	79,875
April.....	18,900	1,230	3,456	0.127	0.14	205,648
May.....	21,552	6,979	12,180	0.450	0.52	749,478
June.....	64,234	6,824	31,046	1.116	1.28	1,844,668
July.....	34,458	14,810	25,907	0.956	1.10	1,592,932
August.....	17,513	10,773	13,675	0.505	0.58	840,842
September.....	11,744	6,232	8,589	0.317	0.35	511,081
October.....	8,164	5,065	6,942	0.256	0.30	426,848
November.....	5,564	2,296	4,199	0.155	0.17	249,859
December.....	2,261	1,265	1,718	0.064	0.07	105,634
The Year.....					4.66	6,743,086

a The drainage area given in this table is only approximate. It must be remembered that the greater part of the run-off at this station is derived from the eastern slope of the Rocky Mountains and must not be used to base estimates of run-off on other streams in the same territory.

NORTH SASKATCHEWAN RIVER AT PRINCE ALBERT.

Location.—At the Canadian Northern Railway and traffic bridge on river lot 76, Prince Albert Settlement.

Records available.—October 2, 1911, to December 31, 1914.

Gauge.—Chain length 40.314 feet; elevation of zero maintained at 1,370.397 feet since establishment.

Bench-mark.—Brass bolt on top of the right abutment Canadian Northern Railway bridge, downstream side, marked P.W.D. B.M. 47. The elevation of this bench-mark is 1,403.502 feet above sea-level, established by Canadian Geodetic Surveys, 1913, and equals an assumed elevation by the Public Works Department in 1911 of 1,489.202 feet.

Channel.—Permanent.

Discharge measurements.—From bridge to gauge.

Winter flow.—Affected by ice.

Maximum flow.—During the floods of August, 1899, the river reached a gauge height of 25.9 feet, which would give a discharge of 160,000 sec.-ft.

Minimum flow.—On January 19, 1914, the lowest recorded discharge took place, when the flow was 850 sec.-ft.

Observer.—W. Moodie.

DISCHARGE MEASUREMENTS of North Saskatchewan River at Prince Albert, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 2.....	W. H. Storey.....	600	2,616	0.56	3.90	1,454
Jan. 5.....	do.....	600	2,520	0.50	3.78	1,249
Jan. 9.....	do.....	600	2,520	0.50	3.68	1,272
Jan. 12-13.....	do.....	600	2,392	0.43	3.50	1,020
Jan. 19.....	do.....	600	2,260	0.38	3.41	850
Jan. 21.....	do.....	600	2,414	0.47	3.75	1,132
Jan. 23.....	do.....	600	2,430	0.48	3.84	1,174
Jan. 26.....	do.....	600	2,486	0.63	4.05	1,565
Jan. 28.....	do.....	600	2,440	0.63	4.06	1,529
Jan. 29.....	do.....	600	2,440	0.57	4.03	1,383
Jan. 30.....	do.....	600	2,304	0.59	4.00	1,423
Feb. 2.....	do.....	600	2,370	0.53	4.00	1,252
Feb. 4.....	do.....	600	2,394	0.54	4.06	1,290
Feb. 6.....	do.....	600	2,322	0.62	4.06	1,433
Feb. 9.....	do.....	600	2,278	0.51	4.01	1,165
Feb. 11.....	do.....	600	2,250	0.52	4.00	1,159
Feb. 12.....	do.....	600	2,250	0.48	4.01	1,086
Feb. 13.....	do.....	600	2,222	0.49	4.00	1,097
Feb. 16.....	do.....	600	2,202	0.49	4.02	1,077
Feb. 18.....	do.....	600	2,142	0.52	4.06	1,112
Feb. 20.....	do.....	600	2,152	0.52	4.15	1,120
Feb. 23.....	do.....	600	2,166	0.56	4.19	1,203
Feb. 25.....	do.....	600	2,138	0.56	4.21	1,200
Feb. 27.....	do.....	600	2,138	0.57	4.23	1,212
Mar. 2.....	do.....	600	2,138	0.58	4.26	1,244
Mar. 4.....	do.....	600	2,080	0.59	4.24	1,229
Mar. 6.....	do.....	600	2,080	0.60	4.29	1,237
Mar. 9.....	do.....	600	2,140	0.58	4.36	1,232
Mar. 11.....	do.....	600	2,114	0.59	4.32	1,245
Mar. 13.....	do.....	600	2,064	0.60	4.30	1,234
Mar. 16.....	do.....	600	2,110	0.60	4.29	1,277
Mar. 18.....	do.....	600	2,130	0.62	4.30	1,331
Mar. 20.....	do.....	600	2,114	0.64	4.34	1,353
Mar. 23.....	do.....	600	2,124	0.64	4.40	1,370
Mar. 25.....	do.....	600	2,106	0.65	4.37	1,361
Mar. 27.....	do.....	600	2,100	0.64	4.40	1,354
Mar. 30.....	do.....	600	2,130	0.64	4.49	1,370
April 1.....	do.....	600	2,154	0.65	4.46	1,402
April 3.....	do.....	600	2,174	0.67	4.51	1,453
April 6.....	do.....	600	2,184	0.68	4.54	1,492
April 8.....	do.....	600	2,242	0.68	4.60	1,524
April 10.....	do.....	600	2,248	0.72	4.61	1,617
April 13.....	do.....	600	2,358	0.78	4.70	1,839
April 15.....	do.....	600	2,514	0.81	4.73	2,036
April 16.....	do.....	605	2,635	0.88	4.86	2,319 ^a
April 17.....	do.....	640	2,827	0.96	4.91	2,713 ^a
April 18.....	do.....	660	3,223	1.07	4.97	3,448 ^a
April 19.....	do.....	680	3,495	1.20	5.05	4,194 ^a
April 20.....	do.....	772	4,445	1.75	5.87	7,778 ^a
April 21.....	do.....	805	4,958	1.90	6.52	9,420 ^a
April 22.....	do.....	775	4,475	1.75	5.91	7,831 ^a
April 22-23.....	do.....	755	4,166	1.66	5.50	6,908
April 23.....	do.....	740	3,269	1.67	4.65	5,557 ^a
April 23-24.....	do.....	732	3,232	1.69	4.60	5,466
May 25-27.....	do.....	820	6,164	2.45	6.88	15,130
June 24-25.....	do.....	854	8,669	4.38	11.10	37,939
July 20.....	do.....	856	7,294	3.67	9.54	27,144
Aug. 14-15.....	do.....	837	5,836	2.85	7.45	16,622
Sept. 10-11.....	do.....	805	4,754	2.39	6.17	11,372
Oct. 10-12.....	F. R. Steinberger.....	790	4,087	1.97	5.41	8,040
Nov. 21-23.....	do.....	607	3,012	0.68	3.95	2,040
Dec. 10-12.....	do.....	632	2,353	1.48	4.75	3,494

^a Estimated.

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DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Prince Albert,
for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.92 ^a	1,420	3.95	1,265	4.23	1,230	4.46	1,402	6.98	14,588	6.39	11,958
2.....	3.90	1,354	4.00	1,252	4.26	1,244	4.49	1,430	6.76	13,580	6.24	11,534
3.....	3.86	1,390	4.03	1,270	4.27	1,235	4.51	1,453	6.66	13,134	6.32	12,086
4.....	3.84	1,340	4.06	1,290	4.27	1,229	4.53	1,465	6.23	11,293	6.66	13,134
5.....	3.78	1,249	4.06	1,380	4.27	1,235	4.54	1,480	5.92	10,076	6.60	12,870
6.....	3.74	1,230	4.07	1,433	4.29	1,237	4.55	1,492	5.75	9,445	6.29	11,539
7.....	3.74	1,250	4.03	1,350	4.33	1,235	4.57	1,510	5.61	8,936	6.12	10,850
8.....	3.72	1,265	4.03	1,190	4.36	1,233	4.60	1,524	5.50	8,550	5.98	10,304
9.....	3.67	1,272	4.01	1,165	4.36	1,232	4.60	1,595	5.58	8,830	5.63	9,008
10.....	3.61	1,190	4.00	1,160	4.34	1,235	4.62	1,617	5.49	8,516	5.62	8,972
11.....	3.59	1,150	4.00	1,159	4.32	1,245	4.65	1,690	5.60	8,900	5.60	8,900
12.....	3.52	1,070	4.01	1,086	4.32	1,240	4.68	1,770	6.25	11,375	10.69	35,196
13.....	3.47	1,020	4.00	1,097	4.30	1,234	4.70	1,839	7.59	17,520	13.84	57,752
14.....	3.48	1,010	3.99	1,095	4.31	1,250	4.72	1,925	7.68	17,978	14.55	63,290
15.....	3.46	1,000	3.99	1,085	4.32	1,270	4.75	2,036	7.42	16,678	13.55	55,515
16.....	3.39	965	4.02	1,077	4.29	1,277	4.86	2,319 ^f	7.18	15,526	12.60	48,430
17.....	3.34	920	4.03	1,085	4.28	1,295	4.91	2,713	6.83	13,898	12.00	44,100
18.....	3.33	870	4.06	1,112	4.30	1,331	4.97 ^b	3,448	6.85	13,990	11.45	40,245
19.....	3.41	850	4.05	1,115	4.33	1,345	5.05 ^c	4,194	7.10	15,150	11.64	41,560
20.....	3.68	1,020	4.15	1,120	4.34	1,353	5.84	7,778	7.38	16,484	11.17	38,349
21.....	3.75	1,132	4.14	1,145	4.37	1,360	6.50	9,420	7.28	16,004	10.90	36,560
22.....	3.80	1,155	4.17	1,165	4.40	1,370	5.89 ^d	7,831 ^g	7.08	15,056	10.67	35,068
23.....	3.84	1,174	4.19	1,203	4.40	1,370	4.68	5,902	6.90	14,220	10.88	36,430
24.....	3.94	1,250	4.21	1,202	4.35	1,340	4.58	5,614	6.77	13,625	11.07	37,682
25.....	4.01	1,400	4.21	1,200	4.38	1,361	4.85	6,415	6.69	13,266	11.14	38,148
26.....	4.04	1,565	4.21	1,205	4.38	1,355	5.14	7,342	6.93	14,358	11.12	38,014
27.....	4.04	1,560	4.23	1,212	4.40	1,354	5.22	7,606	6.87	14,082	10.90	36,560
28.....	4.06	1,529	4.22	1,202	4.43	1,355	5.34	8,006	7.04	14,808	10.78	35,780
29.....	4.03	1,383	.....	.....	4.48	1,360	6.36	11,832	6.83	13,898	10.69	35,196
30.....	4.00	1,420	.....	.....	4.49	1,370	7.25	15,860	6.76	13,580	10.75	35,585
31.....	3.95	1,360	.....	.....	4.49	1,380	.....	.....	6.60	12,870	.....	.....

a to b Ice conditions.*c* Ice commenced to move.*d* Stream clear of ice.*f to g* Estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of North Saskatchewan River at Prince Albert,
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	10.72	35,390	7.44	16,776	6.76	13,580	5.01	6,922	4.89	6,539	4.30	2,930
2.....	10.37	33,161	7.32	16,196	6.68	13,222	5.02	6,954	4.86	6,446	4.35	3,000
3.....	10.14	31,718	7.27	15,956	6.44	12,172	4.95	6,730	4.79	6,230	4.22	2,940
4.....	10.25	32,405	7.22	15,716	6.27	11,457	4.98	6,826	4.73	6,050	4.18	2,770
5.....	10.34	32,972	7.04	14,868	6.16	11,010	5.20	7,540	4.68	5,902	4.12	2,660
6.....	10.22	32,216	6.99	14,634	6.18	11,090	5.20	7,540	4.60	5,670	4.14	2,670
7.....	10.18	31,966	7.16	15,432	6.28	11,498	5.29	7,837	4.59	5,642	4.15	2,780
8.....	10.02	30,974	7.11	15,197	6.30	11,580	5.35	8,040	4.59	5,642	4.41	3,000
9.....	10.06	31,222	7.04	14,868	6.25	11,375	5.51	8,585	4.54	5,502	4.57	3,250
10.....	10.22	32,216	7.15	15,385	6.24	11,334	5.50	8,550	4.45	5,255	4.70	3,400
11.....	10.44	33,602	7.38	16,484	6.06	10,614	5.42	8,278	4.45	5,255 ^a	4.75	3,500
12.....	10.67	35,068	7.57	17,420	5.94	10,152	5.35	8,040	4.30	4,860	4.75	3,490
13.....	10.76	35,650	7.54	17,270	5.94	10,152	5.35	8,040	4.48	4,336	4.75	3,450
14.....	10.71	35,325	7.56	17,370	6.16	11,010	5.37	8,108	4.42 ^c	3,600	4.72	3,310
15.....	10.31	32,783	7.37	16,436	6.36	11,832	5.34	8,006	4.35 ^c	2,750	4.65	3,170
16.....	10.04	31,098	7.29	16,052	6.30	11,580	5.34	8,006	4.28 ^c	2,100	4.57	3,210
17.....	9.89	30,169	7.30	16,100	6.14	10,930	5.34	8,006	4.22 ^c	1,670	4.52	3,370
18.....	9.55	28,115	6.95	14,450	6.10	10,770	5.44	8,346	4.16	1,730	4.35	3,060
19.....	9.43	27,407	6.69	13,266	6.18	11,090	5.54	8,690	4.10	1,850	4.35	3,000
20.....	9.55	28,115	6.43	12,129	6.06	10,614	5.60	8,900	4.09	2,000	4.23	2,750
21.....	9.90	30,230	6.31	11,622	5.87	9,889	5.61	8,936	4.00	2,140	4.11	2,450
22.....	9.97	30,664	6.30	11,580	5.77	9,519	5.54	8,690	3.96	2,040	4.05	2,100
23.....	9.86	29,986	6.38	11,916	5.63	9,008	5.41	8,244	3.90	1,890	4.00	1,920
24.....	9.53	27,997	6.56	12,694	5.53	8,655	5.30	7,870	4.10	2,030	3.95	1,750
25.....	9.03	25,108	6.74	13,490	5.41	8,244	5.20	7,540	4.10	2,170	3.90	1,610
26.....	8.57	22,601	6.86	14,036	5.30	7,870	5.10	7,210	4.05	2,350	3.85	1,340
27.....	8.34	21,388	6.75	13,535	5.20	7,540	5.07	7,114	4.15	2,470	3.85	1,190
28.....	8.32	21,284	6.51	12,474	5.12	7,276	5.00	6,800	4.20	2,570	3.75	1,050
29.....	8.56	22,548	6.44	12,172	5.06	7,082	4.98	6,826	4.25	2,680	3.75	1,090
30.....	8.30	21,180	6.51	12,474	5.03	6,986	4.96	6,762	4.30	2,700	3.65	1,130
31.....	7.80	18,590	6.64	13,046	.....	.....	4.92	6,634	.....	.....	3.65	1,200 ^b

^a to ^b Ice conditions.

^c Gauge height interpolated.

MONTHLY DISCHARGE of North Saskatchewan River at Prince Albert, for 1914.

(Drainage area 59,900^c square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	1,565	850	1,221	0.0204	0.02	75,072
February.....	1,433	1,077	1,191	0.0199	0.02	66,146
March.....	1,380	1,229	1,295	0.0216	0.02	79,627
April.....	15,860	1,402	4,350	0.0726	0.08	258,840
May.....	17,978	8,516	13,235	0.2210	0.26	813,770
June.....	63,290	8,900	30,347	0.5066	0.57	1,805,773
July.....	35,650	18,590	29,456	0.4918	0.52	1,811,172
August.....	17,420	11,580	14,550	0.2430	0.28	894,650
September.....	13,580	6,986	10,304	0.1720	0.19	613,136
October.....	8,936	6,634	7,763	0.1296	0.15	477,326
November.....	6,539	1,670	3,736	0.0624	0.07	222,310
December.....	3,500	1,050	2,533	0.0423	0.05	155,746
The year.....	.....	.....	.....	.....	2.23	7,273,568

^a The drainage area given in this table is only approximate. It must be remembered that the greater part of the run-off at this station is derived from the eastern slope of the Rocky Mountains, and must not be used to base estimates of run-off on other streams in the same territory.

SESSIONAL PAPER No. 25c

MISCELLANEOUS DISCHARGE MEASUREMENTS made in North Saskatchewan River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				Feet.	Sq. feet.	Ft. per sec.	Sec.-ft.
Feb. 3....	J. S. Tempest...	Brazeau River....	a19-45-10-5....	165	158	1.40	222.0
Mar. 18....	do	do	SE. 24-45-10-5..	173	209	1.36	285.0
Mar. 19....	do	do	do	163	214	1.32	283.0
Mar. 23....	do	Buck Creek	SE. 23-47-6-5...	28	16	0.43	7.0
Nov. 24....	F. R. Steinberger	Little Red River...	49-27-2	29	25	1.01	25.0
Feb. 3....	J. S. Tempest...	Nordeg River....	aSE. 24-45-10-5..	10	5	0.90	4.5
Mar. 18....	do	do	do	50	37	1.18	44.0
Mar. 19....	do	do	do	50	41	1.14	47.0
Feb. 4....	do	North Saskatchewan River....	aSW. 26-45-9-5...	315	828	0.90	746.0
Mar. 20....	do	do	do	270	652	1.29	840.0
Mar. 21....	do	do	do	270	650	1.28	831.0
Mar. 25....	do	do	NW. 2-9-7-5 ..	113	462	2.86	1,324.0
Mar. 26....	do	do	do	113	457	2.44	1,124.0
Sept. 7....	P. H. Daniells...	do	do	380	2,148	3.70	7,950.0

a Approximate locations.

SOUTH SASKATCHEWAN RIVER DRAINAGE BASIN.

General Description.

The upper portion of this drainage basin will be dealt with in the descriptions of the drainage basins of Bow, Little Bow, Oldman, Waterton, Belly, and St. Mary Rivers. These streams are all conjoined at a point known as the Grand Forks, to form the South Saskatchewan River. From the Grand Forks the river flows in a north and easterly direction to its junction with the North Saskatchewan River, a short distance east of the city of Prince Albert. From this point onward the stream takes the name of the Saskatchewan River.

After the confluence of the Bow and Belly Rivers the stream receives comparatively little drainage, the principal tributaries being the Red Deer River, draining that portion of the basin between the North and the South Saskatchewan Rivers, and Sevenpersons River and Swiftcurrent Creek emptying into the main stream from the south. Descriptions of the drainage basin of all these streams are given elsewhere in this report.

The drainage basin of this stream is quite similar to that of all such streams which have their source in the mountains and flow across the prairies. The upper part of the basin has considerable fall, with rock and gravel formation and a good growth of timber. In contrast to this, the prairie section of the basin is sparsely wooded, except along the banks of the stream, and the rock formation changes to earth; also the stream is more apt to change its channel, especially in times of flood. The high water occurs in the hot months of summer, and is caused by the melting of the snow fields in the mountains. The low water occurs in the winter months when there is no melting snow to augment the stream flow.

In addition to the gauging stations on the tributaries, which are taken up in detail elsewhere in this report, there are two stations on the main stream. These stations are located at the cities of Medicine Hat and Saskatoon.

Up to the present the chief value of this stream has been as a source of municipal water supply. There are no irrigation schemes or water power developments on the main stream.

The cities of Medicine Hat and Saskatoon derive their water supply from this stream. The South Saskatchewan is also being considered as a possible source of supply for the cities of Moosejaw and Regina. In this connection, surveys were carried out during 1913 by this Department and also by the Provincial Government.

SOUTH SASKATCHEWAN AT MEDICINE HAT.

Location.—On the NW. $\frac{1}{4}$ Sec. 31, Tp. 12, Rge. 5, W. 4th Mer., at the traffic bridge in the city of Medicine Hat.

Records available.—From May 31, 1911, to December 31, 1914.

Gauge.—Chain gauge. Elevation of zero of gauge (79.78) unchanged since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation 100.00 feet.

Channel.—Shifting.

Discharge measurements.—Made from traffic bridge.

Observer.—E. King.

DISCHARGE MEASUREMENTS of South Saskatchewan River at Medicine Hat, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 9.	R. Palmer.	540	2,287	1.48	3.30	3,396
Jan. 23.	do	490	1,728	1.02	2.30	1,767
Feb. 11-12.	E. W. W. Hughes.	414	2,080	0.69	2.58	1,447
Mar. 3.	do	387	2,340	0.80	2.85	1,981
Mar. 18.	F. R. Burfield.	511	3,186	1.94	3.10	6,184
April 22.	H. D. St. A. Smith.	656	3,562	1.84	3.24	6,554
May 13.	H. S. Kerby.	590	4,857	2.42	5.06	11,793
June 8.	do	746	5,576	3.56	7.51	19,485
June 30.	do	735	5,241	3.20	6.09	16,612
July 29.	do	505	3,096	2.15	3.81	7,953
Aug. 26.	do	510	3,664	1.93	3.70	7,076
Sept. 17.	do	425	2,902	1.24	2.55	3,616
Oct. 13.	do	590	3,743	2.10	3.89	7,885
Oct. 30.	do	495	3,560	1.90	3.53	6,780
Nov. 11.	J. Coughney.	513	3,616	1.78	3.54	6,577
Nov. 23.	do	347	3,203	1.61	3.20	5,162
Dec. 16.	do	443	2,548	0.55	2.40	1,392

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Medicine Hat, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.	1.55	2,900 <i>b</i>	2.26	1,530	2.79	1,860	2.34	4,300	3.81	8,180	5.35	14,125
2.	1.85	3,100	2.23	1,420	2.82	1,900	2.33	4,275	3.90	8,450	5.79	16,250
3.	1.90	3,250	2.30	1,330	2.84	1,981	2.31	4,225	3.34	6,800	5.20	13,450
4.	2.30	3,400	2.26	1,310	2.99	2,080	1.82	3,240	3.74	7,970	5.59	15,250
5.	3.20	3,500	2.41	1,360	3.44	2,500	1.54	2,760	4.53	10,655	6.22	18,400
6.	3.25	3,580	2.38	1,460	3.39	2,620	2.68	5,150	5.02	12,640	7.34	24,200
7.	3.50	3,580	2.51	1,470	3.19	2,690	2.16	3,920	5.07	12,865	7.60	25,500
8.	3.46	3,510	2.45	1,470	2.85	3,000	1.52	2,730	4.99	12,460	7.54	25,000
9.	3.25	3,396	2.61	1,570	2.79	3,120	1.96	3,520	4.89	12,060	7.49	24,600
10.	3.10	3,240	2.78	1,620	2.92	3,300	3.16	6,350	4.62	10,970	7.25	23,150
11.	3.00	3,000	2.68	1,510	2.99	3,600	2.80	5,450	4.38	10,130	6.59	19,300
12.	2.85	2,740	2.47	1,490	3.70	3,800	2.70	5,200	5.16	13,270	6.32	17,750
13.	2.80	2,970	2.43	1,570	3.20	4,300	2.73	5,275	5.25	13,675	5.97	16,000
14.	2.65	2,860	2.63	1,670	3.00	4,600	2.10	3,800	5.02	12,640	5.80	15,200
15.	2.10	2,910	2.63	1,800	2.60	4,900	2.60	4,950	5.28	13,810	5.79	15,155
16.	3.00	2,820	2.83	1,800	2.00	5,150	2.96	5,850	5.16	13,270	6.73	19,800
17.	2.60	2,600	2.53	1,600	3.00	5,600	3.28	6,650	5.56	15,100	7.05	21,400
18.	2.80	2,400	2.88	1,560	2.80	6,184	3.29	6,675	5.90	16,800	7.24	22,350
19.	2.70	2,360	2.23	1,570	1.65	5,000	3.36	6,850	6.20	18,300	7.50	23,650
20.	2.70	2,260	2.18	1,580	1.50	4,900	2.87	5,625	6.57	20,150	7.76	24,950
21.	2.75	2,080	2.28	1,600	1.25	4,800	2.70	5,200	6.54	20,000	7.86	25,450
22.	2.20	1,940	2.29	1,600	1.35 <i>a</i>	4,700	3.13	6,275	6.61	20,350	7.38	23,050
23.	2.30	1,767	2.52	1,610	1.45 <i>a</i>	4,750	3.91	8,480	6.30	18,800	7.40	23,150
24.	2.15	1,740	2.54	1,650	1.55 <i>a</i>	4,800	3.60	7,550	6.31	18,850	7.11	21,700
25.	2.17	1,720	2.64	1,700	1.65 <i>a</i>	4,900	3.62	7,610	6.03	17,450	6.75	19,900
26.	2.20	1,670	2.84	1,760	1.75 <i>a</i>	4,800	3.55	7,400	5.97	17,150	6.21	17,200
27.	2.20	1,590	2.84	1,720	1.85 <i>a</i>	4,750	3.62	7,610	6.36	19,100	6.03	16,300
28.	2.18	1,480	2.89	1,810	1.95 <i>a</i>	4,700	3.80	8,150	6.28	18,700	6.20	17,150
29.	2.15	1,490	.....	.....	2.05 <i>a</i>	4,600	3.87	8,360	6.45	19,550	6.47	18,500
30.	2.20	1,530	.....	.....	2.15 <i>a</i>	4,500	4.11	9,185	6.09	17,750	6.18	17,050
31.	2.25	1,540	.....	.....	2.25 <i>a</i>	4,300 <i>b</i>	.....	.....	5.97	17,100	.....	.....

a Gauge height interpolated.
b Ice conditions Jan. 1 to Mar. 31.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Medicine Hat, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	6.07	16,500	3.70	7,100	3.15	5,625	2.89	4,975	3.46	6,400	2.99	4,300
2.....	5.81	15,245	3.60	6,800	3.04	5,350	2.93	5,075	3.25	5,875	2.58	4,025
3.....	5.79	15,155	3.56	6,680	3.04	5,375	2.95	5,125	3.35	6,125	2.36	3,700
4.....	5.69	14,705	3.52	6,560	3.02	5,300	2.81	4,775	3.20	5,750	1.02	3,400
5.....	5.96	15,950	3.62	6,860	3.00	5,250	3.01	5,275	3.12	5,550	1.40	3,200
6.....	6.16	16,950	3.56	6,680	2.90	5,000	3.17	5,675	3.34	6,100	1.26	3,100
7.....	6.34	17,850	3.52	6,560	2.78	4,700	3.52	6,560	3.48	6,450	0.58	2,775
8.....	6.69	19,600	3.52	6,560	2.85	4,875	3.58	6,740	3.57	6,710	0.79	2,475
9.....	6.69	19,600	3.72	7,160	2.81	4,775	3.33	6,075	3.53	6,590	1.13	2,250
10.....	6.47	18,500	3.46	6,400	2.76	4,650	3.38	6,200	3.62	6,860	1.20	2,050
11.....	6.24	17,350	3.52	6,560	2.72	4,550	3.95	7,875	3.50	6,500	1.50	1,850
12.....	6.07	16,500	3.59	6,770	2.71	4,525	3.10	5,500	3.34	6,100	1.56	1,600
13.....	5.94	15,550	3.59	6,770	2.68	4,450	3.66	6,980	3.52	6,560	1.68	1,500
14.....	5.79	15,155	3.42	6,300	2.36	3,650	3.63	6,890	3.21	6,100	2.08	1,420
15.....	5.63	14,435	3.27	5,925	1.86	2,420	3.64	6,920	3.29	5,200	2.25	1,380
16.....	5.75	14,975	2.94	5,100	2.62	4,300	3.48	6,450	2.69	4,100	2.32	1,392
17.....	5.80	15,200	3.28	5,950	2.34	3,600	3.76	7,280	2.35	4,175	2.30	1,425
18.....	5.81	15,245	3.12	5,550	2.45	3,875	4.47	9,695	1.79	4,600	2.52	1,500
19.....	5.77	15,065	3.41	6,275	2.38	3,700	4.91	11,340	1.60	5,000	2.56	1,550
20.....	5.60	14,300	3.65	6,950	2.25	3,375	5.25	12,725	2.34	5,100	2.64	1,670
21.....	6.07	16,500	3.73	7,190	2.47	3,925	5.14	12,260	4.79	5,150	2.73	1,725
22.....	5.81	15,245	3.90	7,700	2.30	3,500	4.88	11,220	2.95	5,160	2.88	1,790
23.....	4.68	10,430	3.74	7,220	2.36	3,650	4.83	11,020	3.21	5,162	2.95	1,790
24.....	4.94	11,460	3.72	7,160	2.57	4,175	4.53	9,905	3.21	5,160	3.08	1,760
25.....	4.73	10,620	3.42	6,300	2.93	5,075	4.37	9,345	4.94	5,125	3.12	1,750
26.....	4.53	9,905	3.75	7,250	3.07	5,425	4.05	8,225	4.23	5,110	3.13	1,830
27.....	3.97	7,945	3.62	6,860	3.00	5,250	3.95	7,875	3.20	5,110	3.11	2,015
28.....	4.06	8,260	3.62	6,860	2.79	4,725	3.84	7,520	3.08	5,100	3.23	2,380
29.....	4.12	8,470	3.45	6,375	2.85	4,875	3.56	6,680	3.12	5,000	3.26	2,600
30.....	3.87	7,610	3.33	6,075	2.76	4,650	3.62	6,860	2.86	4,750	3.39	2,700
31.....	3.74	7,220	3.22	5,800	.....	.....	3.52	6,560	.....	.....	3.45	2,775

a Ice conditions Nov. 13 to Dec. 31.

MONTHLY DISCHARGE of South Saskatchewan River at Medicine Hat, for 1914.

(Drainage area 22,700 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	3,580	1,480	2,547	0.112	0.13	156,608
February.....	1,810	1,310	1,576	0.069	0.07	87,527
March.....	6,184	1,860	4,022	0.177	0.20	247,304
April.....	9,185	2,730	5,754	0.253	0.28	342,386
May.....	20,350	6,800	14,679	0.647	0.75	902,576
June.....	25,500	13,450	19,831	0.874	0.98	1,180,026
July.....	19,600	7,220	14,122	0.622	0.72	868,342
August.....	7,700	5,100	6,590	0.290	0.33	403,200
September.....	5,625	2,420	4,486	0.198	0.22	266,934
October.....	12,725	4,775	7,600	0.335	0.39	467,306
November.....	6,860	4,100	5,556	0.245	0.27	330,605
December.....	4,300	1,380	2,251	0.099	0.11	138,410
The year.....					4.45	5,393,224

SOUTH SASKATCHEWAN RIVER AT SASKATOON.

Location.—On SW. $\frac{1}{4}$ Sec. 28, Tp. 36, Rge. 5, W. 3rd Mer., at the Canadian Northern Railway bridge in the city of Saskatoon.

Records available.—May 27, 1911, to December 31, 1914.

Gauge.—Chain. Elevation of zero maintained at 1,527.59 feet since establishment.

Bench-mark.—Painted mark on side of downstream end of left abutment; elevation 1,553.35 feet, referred to a waterworks bench-mark of the city of Saskatoon on top of hydrant 300 feet northeast, elevation 1,571.31 feet.

Channel.—Permanent.

Discharge measurements.—From bridge.

Observer.—A. B. Hay.

DISCHARGE MEASUREMENTS of South Saskatchewan River at Saskatoon, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 12.	F. R. Steinberger.	685	2,136	1.10	4.05	2,343
Jan. 30-31, Feb. 2.	do	682	1,994	1.18	4.23	2,352
Feb. 18, 19, 20.	do	661	1,800	1.11	3.62	1,996
Mar. 9, 10, 11.	do	649	1,961	1.44	4.43	2,931
April 16-17.	do	509	3,043	1.78	5.16	8,450
April 28-30.	W. H. Storey	570	3,321	2.56	5.08	8,511
June 5, 6.	do	712	5,088	4.47	7.80	22,646
July 2	do	751	6,047	4.80	8.85	28,990
July 17	do	724	5,425	4.18	8.21	22,762
Aug. 12-13.	do	532	3,289	2.83	4.90	9,332
Sept. 8, 9.	do	507	3,030	2.76	4.40	8,370
Oct. 20-21.	F. R. Steinberger	564	3,127	2.83	5.09	8,854
Dec. 2-3.	do	677	3,118	2.14	5.42	6,662
Dec. 18, 19, 21.	do	588	1,358	1.46	3.19	1,979

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Saskatoon, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	4.09	3,160 ^a	4.15	2,370	4.15	2,200	6.34	3,620	5.48	9,970	7.38	20,130
2.....	4.21	3,150	4.15	2,350	4.17	2,300	6.12	3,650	5.37	9,545	7.40	20,250
3.....	4.26	3,200	4.16	2,330	4.19	2,370	6.16	3,690	5.20	8,950	7.57	21,270
4.....	4.33	3,250	4.12	2,300	4.19	2,460	6.04	3,740	5.20	8,950	7.72	22,170
5.....	4.35	3,250	4.14	2,280	4.25	2,580	5.86	3,800	5.10	8,600	7.82	22,770
6.....	4.13	3,240	4.15	2,290	4.30	2,660	5.64	3,850	5.00	8,300	7.54	21,090
7.....	4.06	3,170	4.13	2,300	4.38	2,740	5.44	3,940	5.20	8,950	7.42	20,370
8.....	4.11	3,150	4.10	2,300	4.40	2,800	5.29	4,150	5.25	9,125	7.02	17,970
9.....	4.17	3,150	4.09	2,280	4.42	2,870	5.18	4,650	5.08	8,540	7.02	17,970
10.....	4.11	3,080	4.09	2,250	4.48	2,930	5.47	5,050	4.92	8,060	6.77	16,585
11.....	4.08	2,670	4.08	2,200	4.38	2,920	6.22	5,550	4.70	7,500	7.02	17,970
12.....	4.05	2,340	4.08	2,160	4.21	2,880	6.64	6,150	5.05	8,450	7.87	23,070
13.....	4.00	2,320	4.08	2,130	4.26	2,780	8.57	6,690	5.65	10,675	8.87	29,124
14.....	3.96	2,320	4.08	2,090	4.28	2,770	10.31	7,100	6.08	12,790	9.17	31,011
15.....	4.08	2,350	4.05	2,050	4.34	2,810	7.70	7,600	6.22	13,560	8.93	29,499
16.....	4.23	2,400	4.07	2,030	4.40	2,870	5.69	8,500 ^a	6.30	14,000	8.92	29,436
17.....	4.23	2,470	4.09	2,010	4.52	3,000	4.81	7,775	6.40	14,550	8.52	26,970
18.....	4.25	2,480	4.02	2,060	4.66	3,160	4.70	7,500	6.27	13,835	8.54	27,090
19.....	4.29	2,440	3.93	1,966	4.75	3,320	4.40	6,900	6.59	15,595	8.57	27,270
20.....	4.28	2,420	3.91	1,950	4.83	3,420	4.32	6,780	6.74	16,420	8.55	27,150
21.....	4.32	2,470	3.85	1,890	4.90	3,470	4.25	6,675	6.62	15,760	8.33	25,830
22.....	4.45	2,530	3.83	1,860	4.96	3,460	4.40	6,900	6.66	15,980	8.62	27,574
23.....	4.68	2,610	3.84	1,870	5.07	3,450	4.55	7,200	6.60	15,650	9.26	31,578
24.....	4.77	2,620	3.95	1,900	5.38	3,430	4.80	7,750	6.81	16,805	9.53	33,279
25.....	4.71	2,610	4.04	2,000	5.80	3,400	4.90	8,000	7.06	18,210	9.74	34,616
26.....	4.61	2,590	3.93	2,120	5.98	3,400	5.08	8,540	7.42	20,370	9.82	35,128
27.....	4.50	2,550	3.96	2,160	6.12	3,450	5.14	8,740	7.78	22,530	9.81	35,064
28.....	4.43	2,450	4.00	2,170	6.00	3,500	4.98	8,240	7.91	23,370	9.67	34,168
29.....	4.30	2,450	.....	.....	6.14	3,560	4.83	7,825	7.91	23,370	9.45	32,775
30.....	4.22	2,430	.....	.....	6.33	3,600	5.22	9,020	7.58	21,330	9.34	32,082
31.....	4.14	2,420	.....	.....	6.52	3,630	.....	.....	7.43	20,430	.....	.....

^a Ice conditions Jan. 1 to April 16.

DAILY GAUGE HEIGHT AND DISCHARGE of South Saskatchewan River at Saskatoon, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	8.91	28,752	6.28	14,160	4.98	9,550	3.65	7,077	6.10	13,350	4.86	6,560
2.....	8.70	28,070	6.12	13,440	4.91	9,375	3.70	7,150	5.88	12,420	5.15	6,640
3.....	8.26	25,410	5.73	11,837	4.83	9,192	4.00	7,600	5.68	11,655	5.75	6,600
4.....	8.20	25,050	5.54	11,165	4.78	9,080	4.40	8,300	5.50	11,025	6.52	6,320
5.....	8.32	25,770	5.43	10,815	4.68	8,860	4.37	8,240	5.30	10,425	6.68	5,880
6.....	8.14	24,690	5.27	10,343	4.52	8,540	4.35	8,200	5.15	10,012	6.10	5,480
7.....	8.03	24,030	5.19	10,123	4.46	8,420	4.36	8,220	5.10	9,875	5.35	5,100
8.....	7.92	23,370	5.10	9,875	4.45	8,400	4.39	8,280	5.06	9,765	4.92	4,700
9.....	7.85	22,950	4.94	9,450	4.33	8,160	4.40	8,300	4.88	9,305	4.72	4,280
10.....	7.77	22,470	4.84	9,215	4.27	8,048	4.57	8,640	4.72	8,945	4.50	3,800
11.....	7.76	22,410	4.88	9,305	4.20	7,925	4.62	8,740	4.65	8,800	4.20	3,400
12.....	8.00	23,850	4.88	9,305	4.13	7,802	4.58	8,660	4.62	8,740	4.00	2,920
13.....	8.34	25,890	4.90	9,350	4.09	7,735	4.62	8,740	4.50	8,500	3.90	2,590
14.....	8.67	27,884	4.83	9,192	4.05	7,675	4.80	9,125	4.00	7,600	3.60	2,200
15.....	8.69	28,008	4.84	9,215	4.13	7,802	5.13	9,957	3.12	6,328	3.45	1,900
16.....	8.58	27,330	4.90	9,350	4.21	7,942	5.19	10,123	2.85	5,970	3.25	1,860
17.....	8.17	24,870	4.90	9,350	4.24	7,995	5.05	9,737	2.72	5,300a	3.25	2,020
18.....	8.10	24,450	4.77	9,057	4.18	7,895	5.10	9,875	3.65	5,550	3.20	2,240
19.....	7.90	23,250	4.82	9,170	4.12	7,785	5.25	10,287	4.65	6,070	3.20	1,980
20.....	7.79	22,590	4.89	9,328	4.10	7,750	5.00	9,600	5.64	6,620	3.25	1,900
21.....	7.46	20,610	4.80	9,125	4.02	7,630	5.11	9,902	5.50	7,100	3.22	1,750
22.....	7.43	20,430	4.64	8,780	3.94	7,510	5.23	10,232	5.20	7,070	3.28	1,700
23.....	7.44	20,490	4.50	8,500	3.82	7,330	5.36	10,605	5.20	7,000	3.25	1,650
24.....	7.50	20,850	4.44	8,380	3.67	7,106	5.58	11,305	5.45	7,000	3.25	1,570
25.....	7.52	20,970	4.53	8,560	3.61	7,020	5.83	12,220	5.42	6,900	3.32	1,580
26.....	7.34	19,830	4.66	8,820	3.67	7,106	6.14	13,530	5.48	6,700	3.45	1,700
27.....	7.08	18,353	4.74	8,990	3.70	7,150	6.46	15,010	5.30	6,380	3.60	1,870
28.....	6.76	16,540	4.85	9,237	3.72	7,180	6.73	16,382	5.36	6,720	3.65	2,040
29.....	6.46	15,000	5.00	9,600	3.75	7,225	6.72	16,330	5.08	6,980	3.70	2,150
30.....	6.40	14,725	5.10	9,875	3.70	7,150	6.47	15,057	4.85	6,420	3.75	2,250
31.....	6.38	14,630	5.04	9,710	.....	.....	6.32	14,345	.....	.....	3.80	2,700a

a Ice conditions Nov. 17 to Dec. 31.

MONTHLY DISCHARGE of South Saskatchewan River at Saskatoon, for 1914.

(Drainage area 64,500a square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	3,250	2,320	2,702	0.042	0.05	166,140
February.....	2,370	1,860	2,130	0.033	0.03	118,290
March.....	3,630	2,200	3,038	0.047	0.05	186,798
April.....	9,020	3,620	6,319	0.098	0.11	376,010
May.....	23,370	7,500	13,876	0.215	0.25	853,212
June.....	35,128	16,585	26,375	0.409	0.46	1,569,425
July.....	28,752	14,630	22,694	0.352	0.41	1,395,428
August.....	14,160	8,380	9,762	0.151	0.17	600,242
September.....	9,550	7,020	7,945	0.123	0.14	472,760
October.....	16,382	7,077	10,315	0.160	0.18	634,230
November.....	13,350	5,300	8,151	0.126	0.14	485,019
December.....	6,640	1,570	3,204	0.050	0.06	197,006
The year.....	.....	.....	.....	.....	2.05	7,054,560

a The drainage area given in this table is only approximate. It must be remembered that the greater part of the run-off at this station is derived from the eastern slope of the Rocky Mountains, and must not be used to base estimates of run-off on other streams in the same territory.

RED DEER RIVER DRAINAGE BASIN.

General Description.

The Red Deer River rises in the Sawback Range of the Rockies in the northern portion of the Rocky Mountain Park, near the boundary between the provinces of Alberta and British Columbia. It flows eastward for about 40 miles, then northeastward for 70 or 80 miles to a point near Red Deer, Alberta. From here the river flows in a southeasterly and easterly direction to its junction with the South Saskatchewan River just east of the 4th Mer., in Tp. 22, Rge. 28, W. 3rd Mer. It has a length of approximately 400 miles.

The valley of the Red Deer is wide and deep, the banks being very rough and cut up with a large number of deep coulees, draining into the river. Near its source the basin is well timbered, and a good growth of timber is found along its banks for some distance out into the prairie. Seams of coal well suited for domestic use are found in the valley, and form the principal source of fuel supply for the settlers along the stream in the prairie section.

The river carries a considerable supply of water at all times of the year, but the volume is subject to sudden variations, due to the melting of snow in the mountains and to heavy summer rains.

Of the tributaries of the Red Deer, the most important are Panther River, near its head, Little Red Deer and Medicine Rivers entering in Tp. 36, Rge. 1, W. 5th Mer., and Rosebud River emptying into it in Tp. 28, Rge. 19, W. 4th Mer. In addition, there are numerous small streams draining into the main river in the western portion of the basin. From the mouth of the Rosebud River eastward there is very little drainage into the river.

Very little hydrometric work has been done in this basin as yet. A gauging station was established on the Red Deer River near Innisfail in 1910, but an observer could not be secured, and only periodic discharge measurements were obtained at this station. In December, 1911, another station was established at the town of Red Deer, and continuous records have been obtained since then. Of the tributaries of the Red Deer River, Berry and Blood Indian Creeks are the only ones which have been given any attention. These small creeks, which drain into the river in the prairie section, have a few small irrigation rights registered against them. Gauging stations were established on them in 1911, but owing to the high cost of obtaining data they were abandoned in 1913.

RED DEER RIVER AT RED DEER.

Location.—On the SE. $\frac{1}{4}$ Sec. 20, Tp. 38, Rge. 27, W. 4th Mer., at the steel traffic bridge in the town of Red Deer.

Records available.—January 1, 1912, to December 31, 1914.

Gauge.—Chain. Length of chain from bottom of weight to marker is 29.52 feet. Zero elevation of gauge maintained at 84.40 feet since established.

Bench-mark.—Marked with white paint on northwest face of north abutment; assumed elevation, 100.00 feet.

Channel.—Slightly shifting.

Discharge measurements.—Made from bridge.

Winter flow.—From November to April river is frozen over, and measurements are made at a point about one-half mile below the bridge.

Observer.—C. H. Snell.

Observer.—W. Austin.

DISCHARGE MEASUREMENTS of Red Deer River at Red Deer, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 20.....	J. S. Tempest.....	190a	319	0.96	4.89	309
Feb. 24.....	do.....	180a	284	1.04	5.03	306
Mar. 3.....	do.....	193a	298	1.18	5.04	351
Mar. 31.....	do.....	257a	365	1.11	4.88	404
April 23.....	do.....	356	673	2.27	4.26	1,532
April 28.....	G. J. Smith and J. M. Paul..	239	612	2.00	3.90	1,224
May 21.....	J. M. Paul.....	268	754	2.52	4.46	1,902
June 9.....	G. R. Elliott.....	337	1,157	3.54	5.89	4,093
July 2.....	J. M. Paul.....	333	1,023	3.20	5.36	3,274
July 16.....	do.....	324	939	2.83	5.00	2,655
Aug. 13.....	do.....	243	603	1.96	3.90	1,186
Aug. 25.....	do.....	239	613	1.95	3.88	1,195
Sept. 12.....	do.....	239	630	1.87	3.90	1,180
Oct. 1.....	do.....	236	552	1.85	3.74	1,024
Oct. 17.....	do.....	243	682	2.26	4.29	1,544
Nov. 9.....	H. S. Kerby.....	225	524	1.36	3.45	715
Dec. 1.....	R. J. McGuinness.....	272a	547	1.26	4.51	690
Dec. 18.....	do.....	249a	313	0.88	3.63	274

a Measured below regular station.

DAILY GAUGE HEIGHT AND DISCHARGE of Red Deer River at Red Deer, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	4.28	195a	4.89	302	5.06	338	4.97	406	3.81	1,110	4.00	1,300
2.....	4.42	210	4.93	296	5.01	345	4.97	407	3.91	1,210	4.22	1,544
3.....	4.47	220	4.91	289	5.02	351	4.97	408	4.16	1,472	4.52	1,921
4.....	4.54	235	4.96	280	5.04	357	4.97	410	4.40	1,765	5.26	3,087
5.....	4.63	250	4.96	271	5.07	360	5.14	409	4.66	2,114	5.44	3,402
6.....	4.67	260	4.99	270	5.08	365	5.33	404	4.87	2,442	5.06	2,747
7.....	4.67	266	4.95	270	5.03	361	5.58	399	4.90	2,490	5.04	2,714
8.....	4.79	286	4.90	275	4.99	355	5.94	394	4.84	2,394	6.44	5,349
9.....	4.80	290	4.97	282	5.06	362	6.17	390	4.74	2,234	5.94	4,340
10.....	4.74b	285	4.95	290	5.05	361	6.11	390	4.64	2,086	5.86	4,180
11.....	4.68b	280	4.95	280	5.04	358	5.88	390	4.56	1,974	5.92	4,300
12.....	4.61	276	4.95	283	5.03	355	5.83	410	4.46	1,843	6.20	4,860
13.....	4.64	279	4.95	286	5.00	350	5.38	450	4.40	1,765	6.37	5,202
14.....	4.67	281	4.98	292	5.01	355	5.04	490	4.26	1,592	6.54	5,559
15.....	4.69	286	4.99	300	5.13	372	5.40	471	4.30	1,640	6.51	5,496
16.....	4.77	295	4.99	307	5.19	397	5.58	450	4.63	2,072	6.37	5,202
17.....	4.75	294	4.99	315	5.29	419	4.85	890	5.10	2,815	6.26	4,980
18.....	4.72	291	5.00	315	5.29	425	4.73	1,280	4.82	2,362	6.04	4,540
19.....	4.80b	300	5.02	307	5.24	420	4.77	1,750a	4.62	2,058	5.82	4,103
20.....	4.89	309	4.94	295	5.21	415	4.76	2,266	4.51	1,908	5.66	3,799
21.....	4.84	301	5.05	315	5.07	401	4.46	1,843	4.47	1,856	5.48	3,474
22.....	4.85	303	5.07	314	5.11	404	4.33	1,676	4.42	1,791	5.32	3,189
23.....	4.79	290	4.99	305	5.19	410	4.24	1,568	4.48	1,869	5.11	2,832
24.....	4.77	288	5.03	306	5.11	400	4.23	1,556	4.54	1,947	4.97	2,602
25.....	4.77	288	5.03	310	5.11	395	4.15	1,460	4.59	2,016	4.97	2,602
26.....	4.77	287	5.08	320	5.02	392	4.05	1,350	4.88	2,458	5.22	3,019
27.....	4.82	294	5.08	325	4.87	386	3.97	1,270	4.57	1,988	5.41	3,348
28.....	4.71	281	5.08	330	4.83	381	3.90	1,200	4.35	1,700	5.54	3,582
29.....	4.85	299	.....	.....	4.85	388	3.84	1,140	4.20	1,520	5.46	3,438
30.....	4.89	305	.....	.....	4.88	398	3.84	1,140	4.07	1,370	5.41	3,348
31.....	4.88	304	.....	.....	4.95	404	.....	.....	3.98	1,280	.....	.....

a Ice conditions Jan. 1 to April 19.

b Gauge heights interpolated.

MONTHLY DISCHARGE of Red Deer River at Red Deer, for 1912-13.

(Drainage area 4,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
1912.						
January.....	264	222	238	0.053	0.06	14,635
February.....	313	248	274	0.061	0.06	15,764
March.....	1,425	246	401	0.089	0.10	22,270
April.....	2,698	1,290	1,919	0.426	0.48	114,190
May.....	7,040	1,705	3,954	0.879	1.01	243,124
June.....	13,532	1,450	3,953	0.878	0.98	235,220
July.....	19,043	3,232	10,091	2.240	2.58	620,448
August.....	7,010	3,340	4,985	1.110	1.28	306,515
September.....	8,744	2,908	4,532	1.010	1.13	269,670
October.....	4,353	1,585	2,721	0.605	0.70	167,311
November.....	1,765	560	1,290	0.287	0.32	76,760
December.....	867	434	545	0.121	0.14	33,511
The year.....					8.84	2,119,418
1913.						
January.....	436	373	417	0.093	0.11	25,640
February.....	431	360	396	0.088	0.09	21,993
March.....	440	370	410	0.091	0.10	25,210
April.....	10,236	460	3,887	0.864	0.96	231,292
May.....	9,477	1,262	4,101	0.911	1.05	252,160
June.....	13,500	2,648	4,946	1.100	1.23	294,308
July.....	11,960	3,251	5,242	1.160	1.34	322,318
August.....	5,482	2,153	3,284	0.730	0.84	201,925
September.....	2,944	1,280	1,787	0.397	0.44	106,334
October.....	1,441	900	1,223	0.272	0.31	75,200
November.....	1,080	585	825	0.133	0.20	49,091
December.....	555	105	327	0.073	0.08	20,106
The year.....					6.75	1,625,577

NOTE.—These tables are inserted in this report to correct tables published on page 59 of the report for 1912 and page 67 of the report for 1913. The drainage area, discharges in second-feet per square mile, and run-off in depth in inches on the drainage area were incorrect, but the balance of the tables were correct as then published.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Red Deer River at Red Deer, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	5.38	3,204	4.14	1,448	3.84	1,140	3.75	1,050	3.69	996	4.41	690
2.....	5.35	3,240	4.20	1,520	3.74	1,041	3.74	1,041	3.67	978	4.27	612
3.....	5.30	3,155	4.22	1,544	3.72	1,023	3.76	1,060	3.66	969	4.11	555
4.....	5.33	3,206	4.18	1,496	3.72	1,023	3.82	1,120	3.62	933	4.02	490
5.....	5.36	3,258	4.19	1,508	3.73	1,032	3.90	1,200	3.56	879	3.90	420
6.....	5.32	3,180	4.14	1,448	3.70	1,005	3.94	1,240	3.60	915	3.81	380
7.....	5.36	3,258	4.13	1,436	3.69	996	3.92	1,220	3.50	760 ^a	3.70	300
8.....	5.30	3,155	4.18	1,496	3.72	1,023	3.93	1,230	3.37	660	3.67	280
9.....	5.14	2,883	4.11	1,412	3.92	1,220	4.24	1,568	3.54	715	3.68	280
10.....	4.98	2,618	4.06	1,360	3.82	1,120	4.94	2,554	3.59	740	3.59	240
11.....	4.90	2,490	4.04	1,340	3.75	1,050	5.03	2,698	3.52	720	3.47	200
12.....	4.89	2,474	3.96	1,260	3.95	1,250	4.80	2,330	3.58	740	3.48	210
13.....	4.88	2,458	3.94	1,240	4.05	1,350	4.64	2,086	3.54	720	3.49	210
14.....	4.99	2,634	3.93	1,230	3.91	1,210	4.51	1,908	3.59	720	3.45	200
15.....	5.04	2,714	3.96	1,260	3.85	1,150	4.40	1,765	4.80	720	3.46	215
16.....	5.06	2,650	3.98	1,280	3.82	1,120	4.32	1,664	4.39	730	3.48	227
17.....	4.81	2,346	3.98	1,280	3.78	1,080	4.29	1,628	4.63	760	3.50	240
18.....	4.61	2,044	4.04	1,340	3.74	1,041	4.26	1,592	4.58	740	3.63	274
19.....	4.53	1,934	4.00	1,300	3.71	1,014	4.19	1,508	4.91	770	3.65	300
20.....	4.50	1,895	3.92	1,220	3.75	1,050	4.14	1,448	5.09	800	3.60	280
21.....	4.68	2,142	3.93	1,230	3.87	1,170	4.07	1,370	5.10	800	3.70	288
22.....	4.58	2,002	3.97	1,270	3.83	1,130	4.01	1,310	5.03	755	3.77	298
23.....	4.34	1,688	4.01	1,310	3.79	1,090	3.95	1,250	4.93	765	3.82	307
24.....	4.29	1,628	3.98	1,280	3.76	1,060	3.88	1,180	4.83	742	3.85	320
25.....	4.22	1,544	3.90	1,200	3.72	1,023	3.87	1,170	4.77	720	3.86	330
26.....	4.22	1,544	3.86	1,160	3.74	1,041	3.83	1,130	4.96	760	3.88	340
27.....	4.22	1,544	3.82	1,120	3.78	1,080	3.83	1,130	4.85	752	3.87	340
28.....	4.17	1,484	3.84	1,140	3.82	1,120	3.79	1,090	4.72	745	3.89	335
29.....	4.22	1,544	3.84	1,140	3.88	1,180	3.75	1,050	4.66	735	3.89	320
30.....	4.14	1,448	3.86	1,160	3.80	1,100	3.70	1,005	4.61	720	3.85	338
31.....	4.12	1,424	3.84	1,140	.....	.....	3.72	1,023	.....	.....	3.89	338 ^a

^a Ice conditions Nov. 7 to Dec. 31.

MONTHLY DISCHARGE of Red Deer River at Red Deer, for 1914.

(Drainage area 4,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	309	195	278	0.062	0.07	17,094
February.....	330	270	298	0.066	0.07	16,550
March.....	425	338	380	0.084	0.10	23,365
April.....	2,266	390	902	0.200	0.22	53,673
May.....	2,815	1,110	1,908	0.424	0.49	117,317
June.....	5,559	1,300	3,669	0.815	0.91	218,321
July.....	3,294	1,424	2,351	0.522	0.60	144,561
August.....	1,544	1,120	1,309	0.291	0.34	80,488
September.....	1,350	996	1,098	0.244	0.27	65,335
October.....	2,698	1,005	1,439	0.320	0.37	88,479
November.....	906	715	783	0.174	0.19	46,592
December.....	690	200	328	0.073	0.08	20,168
The year.....	.....	.....	.....	.....	3.71	891,943

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Red Deer drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				Feet.	Sq. ft.	Feet per sec.	Sec.-ft.
Jan. 7....	J. S. Tempest...	Blindman River...	NW. 15-39-27-4.	31	27.6	0.44	12.1
Jan. 21....	do	do	do	28	19.2	0.72	13.8
Feb. 25....	do	do	do	30	23.3	0.94	22.0
Mar. 4....	do	do	do	30	38.7	0.84	24.0
April 24....	do	do	do	97	324.0	0.55	178.0
May 16....	J. M. Paul	do	do	98	307.0	0.60	184.0
June 11....	do	do	do	122	947.0	2.93	2,779.0
June 27....	do	do	do	102	438.0	1.21	529.0
July 15....	do	do	do	100	322.0	0.52	166.0
Aug. 14....	do	do	do	98	283.0	0.21	59.0
Aug. 24....	do	do	do	98	261.0	0.16	41.0
Sept. 17....	do	do	do	62	114.0	0.83	95.0
Sept. 26....	do	do	do	62	116.0	0.58	68.0
Oct. 17....	do	do	do	61	122.0	0.77	94.0
Nov. 7....	H. S. Kerby	do	do	58	93.0	0.27	25.0
Dec. 5....	R. J. McGuinness	do	do	59	143.0	0.17	24.0

BOW RIVER DRAINAGE BASIN.

General Description.

Bow River rises in Lakes Bow and Hector, which are situated in the Rocky Mountains Park, north of the main line of the Canadian Pacific Railway and just east of the Great Divide, and whose elevations are 6,420 and 5,694 feet, respectively, above mean sea level. It flows in a south and easterly direction to the city of Calgary, where it takes a big bend to the south, and then continues in a south and easterly direction to its junction with Belly River at the Grand Forks. Below this point the united stream is known as the South Saskatchewan River.

Bow River has a large number of tributaries in the western portion of its course. Of these the principal are Cascade and Ghost Rivers, draining the northern portion of the basin, and Spray, Kananaskis, Elbow, Sheep, and Highwood Rivers draining the southern portion. Below the mouth of Highwood River very little drainage reaches Bow River, and in consequence it depends for its supply almost wholly upon the run-off from the mountains and foothills. As a result, Bow River possesses a normally steady flow throughout the year, but is subject to sudden freshets caused by melting snow and heavy rains in the mountains. The minimum flow occurs in the frozen season, when there is little run-off from the snowfields in the western part of the drainage basin.

The valley of the Bow is deep and well defined throughout its course. In the mountain section it is comparatively narrow and very heavily timbered, while the bed is stony and the banks high and rocky. The nature of the valley changes gradually until, when it reaches the prairie, it is wide, of a clay formation, and devoid of trees, the bed consisting for the most part of gravel. The water is clear and pure.

A large quantity of water is diverted from the Bow River for irrigation purposes. The two chief users are the Department of Natural Resources, Canadian Pacific Railway Company, and the Southern Alberta Land Company.

The Department of Natural Resources diverts water at two points, one just east of the city of Calgary and the other three miles southwest of Bassano. The first system has been in operation for several years and distributes water over the Western Section of the Irrigation block, which extends east as far as Gleichen. The works at Bassano comprise a very large earth fill dam and concrete spillway, which were completed in 1913. This system is to serve the Eastern Section of the Irrigation block, which extends east from Bassano. In all, it is proposed to irrigate about 1,000,000 acres of land.

The Southern Alberta Land Company have a dam and reservoir near Namaka. These works were practically completed in 1913. It is proposed to irrigate by this system about 300,000 acres.

There are many favourable sites for power development on the Bow River, but only one company has up to the present developed power. The Calgary Power Company has two plants; one is at Kananaskis Falls, at the junction of the Kananaskis and Bow Rivers, and two miles east of Kananaskis station; the other is at Horseshoe Falls, one mile below. The latter plant has been in operation for some years, and has a capacity of 19,500 horse power. The dam at Kananaskis Falls was completed in 1913, and this plant has a rated capacity of 11,600 horse-power. All the power developed is used by the city of Calgary.

The city of Calgary takes its domestic water supply from Elbow River. The intake is about twelve miles southwest of Calgary, above which point the course of the river is through a wild and unsettled country, where there is no possibility of human contamination.

For information regarding floods in this drainage basin see 1913 report.

SESSIONAL PAPER No. 25c

BATH CREEK NEAR LAKE LOUISE.

Location.—On the NE. $\frac{1}{4}$ Sec. 32, Tp. 28, Rge. 16, W. 5th Mer., and one and one-quarter miles west of Lake Louise station, near the mouth of the stream.

Records available.—May 25 to September 20, 1913; discharge measurements only, in 1914.

Gauge.—Vertical staff. Elevation of zero maintained at 89.59 feet during 1913. Elevation of zero maintained at 90.54 feet during 1914.

Bench-marks.—Downstream corner of right concrete abutment, assumed elevation 100.00 feet.

Channel.—Gravel, shifting.

Discharge measurements.—Made by wading.

Observer.—None obtainable in 1914.

DISCHARGE MEASUREMENTS of Bath Creek near Lake Louise, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 16.	H. C. Ritchie	25.5	13.1	0.98	1.05	12.8
Jan. 30.	do	25.0	12.4	0.99	0.99	12.3
Feb. 14.	do	25.0	12.4	1.00	1.00	12.4
Feb. 27.	do	25.3	11.2	0.78	0.56	8.7
Mar. 12.	do	25.6	11.7	0.87	0.95	10.2
Mar. 25.	do	25.8	11.6	0.88	0.98	10.2
April 9.	do	25.5	13.0	1.08	1.05	14.1
April 23.	do	27.0	14.6	1.30	1.10	19.0
May 8.	do	27.5	16.9	1.62	1.22	27.0
May 23.	do	29.0	21.4	2.04	1.41	44.0
June 19.	do	42.0	49.8	4.25	2.54	212.0
July 3.	do	42.5	54.1	4.40	2.59	237.0
July 17.	do	40.5	51.1	4.17	2.40	213.0
July 31.	do	40.5	51.1	4.17	2.40	213.0
Aug. 13.	do	40.0	38.2	3.66	2.00	140.0
Aug. 27.	do	41.5	42.5	4.10	2.12	174.0
Sept. 17.	do	30.4	23.3	2.04	1.50	47.0
Sept. 30.	do	31.5	26.7	2.52	1.67	67.0
Oct. 16.	do	28.7	19.0	1.06	1.28	32.0
Oct. 28.	do	28.7	18.3	1.61	1.25	29.0
Nov. 12.	do	28.8	18.7	1.61	1.20	30.0
Nov. 26.	do	28.0	15.8	1.44	1.15	23.0
Dec. 10.	do	27.6	14.8	1.41	1.10	21.0
Dec. 23.	do	26.0	12.7	1.11	1.00	14.0

BOW RIVER AT LAKE LOUISE.

Location.—On the SE. $\frac{1}{4}$ Sec. 28, Tp. 28, Rge. 16, W. 5th Mer., one-half mile east of Lake Louise station, at the junction of the Bow and Pipestone Rivers.

Records available.—January 1, 1911, to December 31, 1914. In 1910, discharge measurements only.

Gauge.—Chain; elevation of zero maintained at 4,931.72 feet since establishment. Previous to September 1, 1911, gauge at old station was used.

Bench-mark.—Permanent iron bench-mark on the left bank; elevation 4,942.82 feet above mean sea level (Canadian Pacific Railway).

Channel.—Gravel and boulders.

Discharge measurements.—Made from cable and car at low water by wading.

Observer.—E. Braund.

DISCHARGE MEASUREMENTS of Bow River at Lake Louise, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 16.....	H. C. Ritchie.....	74.5	81.4	0.78	6.85	64
Jan. 30.....	do.....	74.0	74.4	0.86	6.39	64
Feb. 14.....	do.....	74.0	71.8	0.86	5.07	62
Feb. 27.....	do.....	72.5	67.3	0.66	4.83	44
Mar. 12.....	do.....	74.0	74.0	0.76	7.51	56
Mar. 25.....	do.....	74.5	79.0	0.78	4.96	62
April 8.....	do.....	53.0	52.8	1.00	4.88	53
April 22.....	do.....	45.0	40.5	1.35	4.39	55
May 7.....	do.....	52.0	87.2	2.28	5.53	199
May 20.....	do.....	66.5	138.0	3.12	6.25	431
June 5.....	do.....	74.0	238.5	5.11	7.62	1,219
June 18.....	do.....	75.0	298.0	5.69	8.38	1,698
July 2.....	do.....	74.0	244.0	5.36	7.89	1,309
July 17.....	do.....	74.0	250.0	5.55	7.66	1,390
Aug. 1.....	do.....	74.0	218.0	5.33	7.34	1,162
Aug. 12.....	do.....	69.5	168.0	4.70	6.66	788
Aug. 26.....	do.....	69.0	159.0	3.99	6.58	733
Sept. 17.....	do.....	56.0	79.2	2.75	5.40	218
Sept. 29.....	do.....	62.0	105.0	2.92	5.82	307
Oct. 15.....	do.....	57.0	82.5	2.23	5.40	184
Oct. 27.....	do.....	48.0	61.5	1.98	4.99	122
Nov. 11.....	do.....	46.5	58.6	1.88	4.94	110
Nov. 25.....	do.....	42.0	55.2	1.63	4.86	90
Dec. 9.....	do.....	42.0	42.1	1.38	6.40	58
Dec. 23.....	do.....	44.0	43.8	1.40	6.20	62

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Lake Louise, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	7.51	68c	6.38	66	4.93	45	4.73	51	5.34	156	6.39	488
2.....	7.57	68	6.11	65	5.27	46	4.51	51	5.65	230	6.77	671
3.....	7.54	68	6.24	64	5.25	47	4.47	52	5.84	284	7.46	1,067
4.....	7.41	68	5.93	56	5.21	48	4.32	52	5.60	216	7.94	1,384
5.....	7.60	68	6.68	48	6.56	49	4.58	52	5.44	177	7.64	1,182
6.....	7.67	68	6.47	49	6.63	50	4.39	52	5.44	177	7.56	1,136
7.....	b	68	5.92	50	5.47	51	4.37	53	5.49	189	7.59	1,150
8.....		68	5.44	52	5.40	52	4.98	53	5.55	203	7.25	940
9.....		66	5.25	54	6.32	54	4.35	53	5.81	275	7.01	802
10.....		64	5.18	56	7.17	55	4.33	53	5.79	269	6.85	714
11.....		64	5.12	57	7.57	56	4.33a	54	5.88	297	6.91	747
12.....		65	5.10	59	7.51	56	4.36a	54c	5.94	316	7.05	824
13.....		66	5.09	61	6.09	56	4.37a	54	6.06	358	7.24	934
14.....		65	5.07	62	6.03	57	4.43a	56	6.15	391	7.49	1,086
15.....	b	64	5.02	62	6.09	58	4.51a	60	6.39	488	7.84	1,315
16.....	6.84	64	4.87	61	5.92	58	4.43a	56	6.53	551	8.05	1,461
17.....	6.82	63	4.92	60	6.23	58	4.41a	55	6.52	547	8.23	1,590
18.....	6.68	62	4.92	52	5.89	59	4.49a	59	6.44	510	8.32	1,656
19.....	6.62	61	4.89	40	6.21	60	4.48a	58	6.35	471	8.14	1,525
20.....	6.62	60	4.96	40	6.26	60	4.43a	56	6.25	430	7.83	1,308
21.....	6.51	57	4.96	41	5.93	61	4.38a	54	6.24	426	7.56	1,130
22.....	6.67	56	4.82	41	4.00	62	4.40	55	6.24	426	7.24	934
23.....	6.38	54	4.86	42	4.46	62	4.52	60	6.51	454	6.95	769
24.....	7.02	53	4.86	42	4.43	62	4.56	64	6.45	514	6.76	666
25.....	7.01	52	4.88	42	4.96	62	4.56	62	6.64	605	6.79	682
26.....	6.72	52	4.94	44	5.68	60	4.64	67	6.52	547	7.00	796
27.....	6.68	52	4.83	44	5.89	50	4.60	64	6.26	434	6.94	763
28.....	6.62	52	5.13	44	5.08	50	4.63	66	6.23	422	7.00	796
29.....	6.50	55			4.89	50	4.86	84	6.11	376	7.14	875
30.....	6.39	64			4.93	50	5.04	106	6.24	426	7.39	1,024
31.....	6.43	66			4.58	50			6.14	387		

a Gauge height interpolated.

b Ice flooded.

c Ice conditions Jan. 1 to April 12.

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DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Lake Louise, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	7.57	1,135	7.33	1,167	6.48	687	5.84	309	5.01	121	4.61	79
2.....	7.87	1,336	7.46	1,252	6.46	677	5.82	302	4.96	115	4.84	78
3.....	8.15	1,533	7.44	1,239	6.46	677	5.74	278	4.99	119	4.84	77
4.....	8.26	1,612	7.47	1,259	6.58	738	5.63	246	5.00	120	4.93	75
5.....	8.32	1,656	7.25	1,116	6.47	682	5.55	225	5.00	120	4.85	73
6.....	8.28	1,626	7.27	1,128	6.33	616	5.54	222	5.00	120	5.01	69
7.....	8.16	1,539	7.30	1,147	6.34	620	5.55	225	4.95	114	5.25	65
8.....	8.04	1,480	7.04	990	6.35	625	5.84	309	5.00	120	6.05	61
9.....	7.95	1,428	6.80	855	6.20	558	5.76	284	4.94	113	6.44	58
10.....	7.95	1,455	6.69	796	6.00	475	5.67	258	4.90	108	6.55	56
11.....	7.96	1,475	6.64	769	5.90	430	5.59	235	4.94	113	6.63	54
12.....	8.24	1,684	6.64	769	5.86	408	5.54	222	4.80	107	6.67	51
13.....	8.51	1,900	6.69	796	5.75	360	5.49	210	4.84	102	6.69	50
14.....	8.43	1,864	6.78	844	5.64	324	5.45	201	4.84	102	6.69	50
15.....	8.50	1,940	6.84	877	5.55	288	5.41	191	4.62	85	6.66	51
16.....	7.96	1,564	6.85	883	5.45	245	5.40	189	4.54	82	6.64	52
17.....	7.66	1,388	6.82	866	5.39	215	5.36	181	4.66	83a	6.53	52
18.....	7.54	1,306	6.66	780	5.55	258	5.37	183	4.69	84	6.53	54
19.....	7.65	1,381	6.74	823	5.82	338	5.34	176	4.86	86	6.65	55
20.....	7.93	1,579	6.83	871	5.64	278	5.34	176	5.06	87	6.64	56
21.....	7.54	1,306	6.94	933	5.54	245	5.24	157	5.28	88	6.55	58
22.....	7.20	1,085	6.94	933	5.45	220	5.14	140	5.34	88	6.43	60
23.....	7.00	967	6.80	855	5.43	210	5.10	134	4.94	89	6.20	61
24.....	7.00	967	6.66	780	5.44	210	5.06	128	4.86	90	6.05	62
25.....	7.09	1,019	6.60	748	5.46	214	5.07	130	4.88	90	5.60	62
26.....	7.03	984	6.62	759	5.63	256	5.04	126	4.86	87	5.40	59
27.....	6.96	944	6.64	769	6.04	385	4.99	119	4.99	84	5.05	59
28.....	6.99	961	6.68	790	5.89	330	4.95	114	5.01	83	4.90	59
29.....	6.97	950	6.68	790	5.80	296	4.95	114	4.78	82	.....	59
30.....	7.00	967	6.61	753	5.75	281	4.95	114	4.65	80	.....	60
31.....	7.22	1,097	6.60	748	.....	.....	5.00	120	.....	.....	.....	60a

a Ice conditions Nov. 17 to Dec. 31.

MONTHLY DISCHARGE of Bow River at Lake Louise, for 1914.

(Drainage area 166 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	68	52	62.0	0.374	0.43	3,812
February.....	66	40	51.9	0.312	0.32	2,882
March.....	62	45	55.0	0.332	0.38	3,382
April.....	106	51	58.9	0.354	0.40	3,505
May.....	605	156	373.0	2.250	2.59	22,935
June.....	1,656	488	1,013.0	6.100	6.81	60,280
July.....	1,940	944	1,725.0	10.000	11.99	106,060
August.....	1,259	748	906.0	5.460	6.30	55,708
September.....	738	210	405.0	2.440	2.72	24,099
October.....	309	114	194.0	1.170	1.35	11,929
November.....	121	80	98.7	0.595	0.66	5,873
December.....	79	50	60.5	0.364	0.42	3,720
The year.....	.....	.....	.....	.....	34.37	304,185

PIPESTONE RIVER AT LAKE LOUISE.

Location.—On the SW. $\frac{1}{4}$ Sec. 27, Tp. 28, Rge. 16, W. 5th Mer., one-half mile east of Lake Louise station, at junction of the Bow and Pipestone Rivers.

Records available.—September, 1, 1911, to October 31, 1911. January 1, 1912, to December 31, 1914.

Gauge.—Chain; elevation of zero maintained at 4,934.08 feet since establishment.

Bench-mark.—Iron spike in tree on left bank; elevation, 4,943.77 feet above mean sea level, (Canadian Pacific Railway).

Channel.—Gravel and boulders.

Discharge measurements.—Made from cable and car; at low water by wading.

Observer.—E. Braund.

DISCHARGE MEASUREMENTS of Pipestone River at Lake Louise, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 14	H. C. Ritchie	36.0	38.6	1.23	4.90	48
Jan. 31	do	36.0	33.5	0.95	4.68	32
Feb. 9	do	35.0	28.5	1.05	4.41	30
Feb. 28	do	37.0	30.0	0.86	4.15	26
Mar. 11	do	35.0	27.5	1.16	5.54	30
Mar. 24	do	41.0	30.0	1.00	4.02	30
April 8	do	36.0	25.4	0.99	3.93	25
April 22	do	41.0	30.8	1.30	4.04	40
May 7	do	57.0	62.8	1.90	4.57	119
May 20	do	69.0	94.9	2.77	5.10	263
June 5	do	76.2	149.8	5.48	5.86	821
June 18	do	78.0	180.0	6.38	6.21	1,149
July 2	do	76.0	163.0	5.96	6.08	971
July 17	do	75.0	122.0	4.26	5.47	519
Aug. 1	do	73.5	111.0	4.03	5.41	459
Aug. 12	do	65.0	88.4	3.29	5.03	291
Aug. 26	do	64.0	81.8	3.07	4.92	251
Sept. 17	do	57.5	57.5	2.12	4.50	122
Sept. 29	do	63.5	81.1	2.72	4.86	221
Oct. 15	do	61.0	69.2	1.94	4.70	132
Oct. 27	do	56.0	52.2	1.59	4.39	83
Nov. 11	do	47.5	50.4	1.36	4.40	69
Nov. 25	do					5
Dec. 22	do	48.0	41.3	0.97	5.94	40

a Ice jam.

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DAILY GAUGE HEIGHT AND DISCHARGE of Pipestone River at Lake Louise, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	6.09	33a	4.65	35	4.15	26	4.15	26	4.68	150	5.38	441
2.....	6.14	34	4.43	34	4.21	28	4.16	28	4.91	232	5.64	610
3.....	6.09	35	4.45	30	4.12	28	4.11	30a	4.98	258	5.99	899
4.....	5.96	36	4.40	24	4.13	28	3.98	29	4.75	179	6.13	1,028
5.....	5.84	37	4.37	22	4.24	27	3.95	27	4.65	150	5.85	778
6.....	5.89	38	4.40	22	4.16	26	3.95	27	4.56	126	5.74	687
7.....	5.54	40	4.43	24	4.05	28	3.95	27	4.57	128	5.76	704
8.....	5.45	41	4.43	28	4.06	30	3.94	26	4.65	150	5.55	546
9.....	5.23	42	4.41	30	4.66	32	3.92	25	4.87	218	5.41	476
10.....	5.05	44	4.36	31	5.40	31	3.92	25	4.82	201	5.40	452
11.....	5.26	45	4.35	31	5.54	30	3.94	26	4.85	211	5.45	482
12.....	5.28	46	4.33	30	4.83	32	4.00	31	4.96	250	5.69	648
13.....	5.02	47	4.33	30	4.22	33	3.98	29	5.09	302	5.75	679
14.....	4.89	48	4.30	30	4.20	34	3.98	29	5.14	324	5.84	770
15.....	4.82	48	4.26	30	4.06	33	3.98	29	5.34	420	6.06	963
16.....	4.72	49	4.23	30	4.14	32	4.02	33	5.36	431	6.15	1,048
17.....	4.65	50	4.21	30	4.24	30	4.00	31	5.36	431	6.22	1,114
18.....	4.65	50	4.27	29	4.19	28	3.95	27	5.27	384	6.20	1,095
19.....	4.61	46	4.24	29	4.23	29	4.02	33	5.18	341	6.04	945
20.....	4.56	40	4.20	28	4.20	30	3.98	29	5.10	306	5.83	761
21.....	4.50	36	4.23	28	4.20	31	3.94	26	5.10	306	5.70	655
22.....	4.55	39	4.25	28	3.98	34	3.99	30	5.14	324	5.52	526
23.....	4.46	36	4.25	28	3.98	33	4.11	42	5.25	374	5.39	447
24.....	4.44	32	4.17	28	4.04	30	4.19	53	5.36	431	5.30	399
25.....	4.44	30	4.16	22	4.24	27	4.15	47	5.45	482	5.36	431
26.....	4.51	33	4.15	26	4.32	24	4.15	47	5.36	431	5.49	506
27.....	4.50	32	4.12	26	4.30	24	4.20	54	5.15	328	5.45	482
28.....	4.50	30	4.14	26	4.26	24	4.18	51	5.04	281	5.52	526
29.....	4.45	28	.....	.....	4.25	24	4.34	78	4.96	250	5.65	618
30.....	4.54	30	.....	.....	4.24	25	4.48	107	5.10	306	5.84	770
1.....	4.67	32	.....	.....	4.20	25	.....	.....	5.12	315	.....	.....

a Ice conditions Jan. 1 to April 3.

DAILY GAUGE HEIGHT AND DISCHARGE of Pipestone River at Lake Louise, for 1914.— *Concluded*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	5.90	820	5.41	458	4.77	185	4.89	225	4.44	97	5.73	40
2.....	6.04	945	5.38	441	4.77	185	4.86	214	4.41	91	5.84	46
3.....	6.14	1,038	5.37	436	4.80	194	4.78	188	4.38	85	5.82	41
4.....	6.06	963	5.40	452	4.84	208	4.73	172	4.41	91	5.75	36
5.....	6.04	945	5.22	360	4.79	191	4.70	163	4.43	96	5.74	34
6.....	6.02	926	5.24	370	4.74	175	4.72	169	4.42	93	5.80	33
7.....	5.95	864	5.28	390	4.74	175	4.72	169	4.35	80	5.72	32
8.....	5.82	753	5.12	315	4.79	191	5.12	315	4.40	78 ^a	5.72	30
9.....	5.73	679	5.03	277	4.72	169	4.95	246	4.39	75	5.84	29
10.....	5.72	671	5.02	273	4.63	144	4.88	221	4.38	72	5.93	28
11.....	5.72	671	4.94	243	4.63	144	4.76	182	4.42	69	5.90	28
12.....	5.83	761	4.94	243	4.64	147	4.73	172	4.38	66	5.88	29
13.....	6.09	991	4.99	261	4.62	141	4.73	172	4.35	60	5.91	30
14.....	6.00	908	5.06	290	4.59	134	4.72	169	4.32	56	5.90	29
15.....	5.97	882	5.07	294	4.56	126	4.68	158	4.03	34	5.84	28
16.....	5.61	588	5.07	294	4.53	119	4.66	152	4.12	30	5.81	29
17.....	5.47	494	5.03	277	4.52	116	4.63	144	4.71	30	5.81	32
18.....	5.44	476	4.96	250	4.65	150	4.65	150	5.32	31	6.41	30
19.....	5.56	553	5.01	269	4.83	204	4.64	147	5.65	33	6.56	31
20.....	5.70	655	5.01	269	4.66	152	4.62	141	5.72	37	5.85	32
21.....	5.45	482	5.04	281	4.61	139	4.51	113	5.74	41	5.92	37
22.....	5.25	374	5.00	265	4.57	129	4.42	93	5.79	47	5.94	40
23.....	5.19	346	4.99	261	4.57	129	4.41	91	5.80	51	6.00	46
24.....	5.24	370	4.92	235	4.62	141	4.41	91	5.80	53	6.03	44
25.....	5.33	415	4.90	228	4.68	157	4.47	104	5.77	54	5.88	42
26.....	5.25	374	4.90	228	4.84	208	4.43	96	5.65	50	5.86	40
27.....	5.25	374	4.91	232	5.12	315	4.39	87	5.70	49	5.63	41
28.....	5.25	374	4.93	239	4.92	235	4.34	78	5.72	50	5.58	42
29.....	5.24	370	4.90	228	4.84	208	4.33	76	5.55	45	5.63	43
30.....	5.25	374	4.85	211	4.80	194	4.33	76	5.54	42	5.63	44
31.....	5.32	410	4.83	204	.....	.....	4.42	93	.....	.....	5.70	45 ^a

^a Ice conditions Nov. 8 to Dec. 31.

MONTHLY DISCHARGE of Pipestone River at Lake Louise, for 1914.

(Drainage area 139 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	50	28	39	0.280	0.32	2,398
February.....	35	22	28	0.203	0.21	1,566
March.....	34	24	29	0.208	0.24	1,777
April.....	107	25	37	0.264	0.29	2,184
May.....	482	126	291	2.100	2.42	17,893
June.....	1,114	441	683	4.910	5.48	40,641
July.....	1,038	346	640	4.600	5.30	39,352
August.....	458	204	293	2.100	2.42	18,016
September.....	315	116	170	1.220	1.36	10,116
October.....	315	76	151	1.080	1.24	9,285
November.....	97	30	60	0.428	0.48	3,540
December.....	46	28	36	0.257	0.30	2,201
The year.....					20.06	148,969

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LOUISE CREEK.

Location.—On the NE. $\frac{1}{4}$ Sec. 20, Tp. 28, Rge. 16, W. 5th Mer., at the Chateau Lake Louise, 500 feet from the lake itself.

Records available.—July 11, 1913, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero 93.72 feet since establishment.

Bench-marks.—Spikes in tree; assumed elevation 100.00 feet.

Channel.—Loose gravel, steep slope.

Discharge measurements.—Made by wading.

Diversions.—The penstock of the Lake Louise power plant takes water from the lake, and this quantity must be added to the discharge of Louise Creek to obtain the total run-off from the lake.

Observers.—James Laing, Sam Farquhar, and David Greig.

DISCHARGE MEASUREMENTS of Louise Creek near Lake Louise, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 29.....	H. C. Ritchie.....	7.7	2.96	0.85	0.73	2.50
Feb. 25.....	do.....	7.6	2.46	0.38	0.39	0.94
May 22.....	do.....	14.0	8.20	1.91	1.08	15.70
June 19.....	do.....	23.0	19.80	3.00	1.70	60.00
July 2.....	do.....	18.0	18.60	3.34	1.73	62.00
July 16.....	do.....	21.0	23.80	3.89	1.95	93.00
July 31.....	do.....	25.5	26.80	3.85	1.96	103.00
Aug. 13.....	do.....	24.2	18.80	1.72	1.72	64.00
Aug. 26.....	do.....	24.0	18.80	1.70	1.70	58.00
Sept. 18.....	do.....	15.9	9.91	1.26	1.26	22.00
Sept. 29.....	do.....	15.7	10.20	1.27	1.27	23.00
Oct. 15.....	do.....	15.0	7.20	1.09	1.09	11.40
Oct. 27.....	do.....	9.0	2.00	0.75	0.75	1.03
Nov. 11.....	do.....	13.5	5.38	1.04	1.04	8.60
Nov. 25.....	do.....	10.0	4.70	0.97	0.97	5.70
Dec. 9.....	do.....	10.0	4.15	0.94	0.94	3.80
Dec. 24.....	do.....	9.0	3.90	0.66	0.66	3.70

DAILY GAUGE HEIGHT AND DISCHARGE of Louise Creek near Lake Louise, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.08	3.5	0.62	2.00	0.41	0.80	0.33	0.20	0.43	0.70	1.14	18
2.....	1.08	3.5	0.63	1.98	0.40	0.80	0.33	0.20	0.42	0.60	1.19	20
3.....	1.07	3.5	0.65	1.96	0.40	0.75	0.31	0.20	0.45	0.90	1.25	23
4.....	1.07	3.5	0.63	1.94	0.40	0.70	0.30	0.20	0.47	1.10	1.37	30
5.....	1.07	3.5	0.69	1.92	0.41	0.70	0.31	0.20	0.48	1.20	1.42	34
6.....	1.07	3.5	0.68	1.90	0.42	0.65	0.32	0.20	0.50	1.40	1.47	38
7.....	1.07	3.5	0.69	1.90	0.42	0.60	0.33	0.19	0.51	1.53	1.50	40
8.....	1.07	3.5	0.56	1.90	0.42	0.60	0.32	0.19	0.53	1.79	1.47	38
9.....	1.08	3.5	0.52	1.80	0.41	0.55	0.32	0.19	0.54	1.92	1.41	33
10.....	1.08	3.5	0.50	1.80	0.41	0.50	0.32	0.19	0.55	2.00	1.37	30
11.....	1.08	3.5	0.48	1.70	0.41	0.50	0.32	0.18	0.56	2.20	1.40	32
12.....	1.08	3.5	0.47	1.63	0.41	0.45	0.32	0.18	0.59	2.60	1.45	36
13.....	1.08	3.5	0.47	1.63	0.40	0.40	0.32	0.18	0.62	3.00	1.43	34
14.....	1.08	3.5	0.47	1.50	0.39	0.40	0.32	0.18	0.65	3.50	1.49	39
15.....	1.07	3.5	0.47	1.40	0.39	0.35	0.32	0.18	0.84	7.70	1.57	46
16.....	1.05	3.4	0.47	1.30	0.39	0.30	0.32	0.17	1.05	14.60	1.60	49
17.....	1.03	3.4	0.47	1.20	0.40	0.30	0.32	0.17	1.13	17.90	1.65	54
18.....	1.01	3.1	0.42	1.10	0.41	0.30	0.32	0.17	1.20	21.00	1.67	57
19.....	0.97	3.3	0.41	1.10	0.41	0.30	0.35	0.17	1.18	20.00	1.70	60
20.....	0.93	3.1	0.51	1.10	0.41	0.30	0.35	0.17	1.15	18.80	1.68	58
21.....	0.86	3.0	0.46	1.05	0.40	0.30	0.34	0.16	1.13	17.90	1.65	54
22.....	0.82	3.0	0.41	1.00	0.39	0.25	0.35	0.20	1.10	16.50	1.55	44
23.....	0.79	2.9	0.40	1.00	0.39	0.24	0.37	0.28	1.10	16.50	1.47	38
24.....	0.76	2.8	0.40	0.96	0.39	0.23	0.36	0.24	1.13	17.90	1.49	39
25.....	0.76	2.8	0.39	0.94	0.39	0.22	0.36	0.24	1.15	18.80	1.50	40
26.....	0.74	2.7	0.40	0.90	0.39	0.21	0.37	0.28	1.16	19.30	1.45	36
27.....	0.72	2.6	0.41	0.90	0.38	0.20	0.36	0.24	1.16	19.30	1.42	34
28.....	0.73	2.6	0.42	0.85	0.35	0.20	0.38	0.32	1.12	17.40	1.50	40
29.....	0.70	2.5	.....	.....	0.36	0.20	0.42	0.60	1.09	16.10	1.56	45
30.....	0.69	2.5	.....	.....	0.36	0.20	0.43	0.70	1.05	14.60	1.63	52
31.....	0.66	2.2	.....	.....	0.34	0.20	.....	.....	1.09	16.10	.....	.....

NOTE.—No measurement was made in March or April, and discharge for these months is only approximate.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Louise Creek near Lake Louise, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.66	56	2.06	111	1.65	53	1.28	23.00	0.84	2.4	0.97	5.1
2.....	1.76	67	2.02	105	1.62	50	1.25	22.00	1.12	8.5	0.96	4.8
3.....	1.81	74	1.98	99	1.56	44	1.22	19.20	0.85	2.7	0.96	4.6
4.....	1.91	89	1.97	97	1.56	44	1.20	17.90	0.86	3.2	0.96	4.6
5.....	1.94	93	1.95	95	1.54	43	1.18	17.00	0.92	4.1	0.96	4.4
6.....	1.96	96	1.93	91	1.54	42	1.16	15.70	0.95	4.8	0.96	4.4
7.....	1.94	93	1.88	84	1.52	40	1.16	15.70	0.96	5.3	0.95	4.1
8.....	1.91	89	1.84	78	1.52	40	1.20	17.00	1.00	6.4	0.94	3.9
9.....	1.90	87	1.74	65	1.46	35	1.20	17.00	1.04	7.7	0.94	3.7
10.....	1.88	84	1.70	60	1.42	32	1.16	14.90	1.04	8.2	0.94	4.1
11.....	1.90	87	1.72	62	1.40	30	1.15	14.60	1.04	8.5	0.92	4.1
12.....	2.04	108	1.74	65	1.38	28	1.14	13.80	1.04	8.5	0.90	4.1
13.....	2.16	126	1.74	65	1.35	26	1.14	13.80	1.05	8.8	0.85	3.5
14.....	2.15	125	1.76	67	1.32	25	1.11	12.30	1.05	8.8	0.84	3.7
15.....	2.07	112	1.78	70	1.29	22	1.09	11.60	1.04	8.5	0.84	4.1
16.....	1.94	93	1.81	74	1.26	20	1.08	10.90	1.04	8.4	0.84	4.4
17.....	1.94	93	1.84	78	1.25	19	1.10	11.30	1.04	8.4	0.81	4.2
18.....	1.95	95	1.74	65	1.25	19	1.09	10.60	1.02	7.7	0.78	4.1
19.....	1.98	99	1.74	65	1.35	27	1.10	10.60	1.00	6.9	0.73	3.5
20.....	2.08	114	1.76	67	1.30	24	1.07	9.30	1.00	6.9	0.70	4.4
21.....	1.94	93	1.80	72	1.26	22	1.05	8.50	1.00	6.6	0.87	7.4
22.....	1.86	81	1.86	81	1.25	22	1.05	8.00	0.99	6.4	0.85	7.4
23.....	1.85	80	1.78	70	1.25	22	.....	Nil ^a	0.99	6.4	0.82	7.1
24.....	1.84	78	1.71	61	1.24	21	.....	Nil	0.99	6.4	0.74	5.3
25.....	1.84	78	1.66	56	1.22	20	.....	Nil	0.97	5.7	0.63	3.2
26.....	1.81	74	1.65	55	1.26	22	.....	Nil	0.98	5.9	0.64	3.4
27.....	1.79	71	1.68	58	1.34	26	0.75	1.10	0.97	5.5	0.62	3.0
28.....	1.76	67	1.76	67	1.32	25	0.76	1.20	0.98	5.7	0.62	3.0
29.....	1.78	70	1.76	67	1.26	22	0.78	1.53	0.99	5.7	0.60	2.7
30.....	1.85	80	1.74	65	1.26	22	0.80	1.80	0.98	5.5	0.58	2.4
31.....	1.95	95	1.73	64	.....	.....	0.82	2.20	.....	.....	0.56	2.2

^a Water dammed back at lake.

MONTHLY DISCHARGE of Louise Creek near Lake Louise, for 1914.

(Drainage area 11 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	3.50	2.20	3.20	0.288	0.33	195
February.....	2.00	0.85	1.44	0.131	0.14	80
March.....	0.80	0.20	0.41	0.037	0.04	25
April.....	0.70	0.16	0.27	0.021	0.02	14
May.....	21.00	0.60	10.20	0.927	1.07	627
June.....	60.00	18.00	40.00	3.610	4.03	2,362
July.....	126.00	56.00	89.00	8.050	9.28	5,448
August.....	111.00	55.00	74.00	6.700	7.72	4,538
September.....	53.00	19.00	30.00	2.690	3.00	1,761
October.....	23.00	Nil	10.40	0.943	1.09	640
November.....	8.80	2.40	6.50	0.589	0.66	386
December.....	7.40	2.22	4.20	0.384	0.44	259
The year.....	.....	.....	.....	.....	27.82	16,335

DISCHARGE MEASUREMENTS of Tail Race of Chateau Lake Louise Power Plant near
Lake Louise, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Jan. 29.....	H. C. Ritchie.....	4.3	1.19	1.56	1.86
Feb. 25.....	do	5.0	1.40	1.10	1.54
Feb. 25.....	do	6.4	5.69	2.63	15.00 ^a
Feb. 25.....	do	6.4	5.65	2.73	15.40 ^a
April 24.....	do	6.5	3.53	1.66	5.90
May 22.....	do	5.3	3.09	1.98	6.10
June 19.....	do				9.10
July 2.....	do	5.7	4.10	2.67	11.00
July 16.....	do	2.8	4.34	2.44	10.60
July 31.....	do	2.8	4.34	2.46	10.70
Aug. 13.....	do	2.6	4.29	2.28	9.80
Aug. 26.....	do	2.7	4.34	2.27	9.80
Sept. 18.....	do	2.5	4.50	2.02	9.10
Sept. 29.....	do	2.5	3.88	1.99	7.70
Oct. 15.....	do	2.5	3.88	2.09	7.80
Oct. 27.....	do	2.5	3.88	1.99	7.70
Nov. 11.....	do	2.5	4.12	2.17	9.00
Nov. 25.....	do	2.5	4.25	2.20	9.30
Dec. 9.....	do	2.5	3.00	1.07	3.20
Dec. 24.....	do	2.5	3.55	1.60	5.70

^a Turbine test.

FORTYMILE CREEK NEAR BANFF.

Location.—On the SW. $\frac{1}{4}$ Sec. 2, Tp. 26, Rge. 12, W. 5th Mer., near the Canadian Pacific Railway station at Banff and one mile from the mouth of the stream.

Records available.—August 1, 1912, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero 91.06 feet since establishment.

Bench-mark.—On right abutment of bridge; elevation assumed, 100.00 feet.

Channel.—Clay and gravel.

Discharge measurements.—Made from bridge.

Observer.—Peter Peterson.

DISCHARGE MEASUREMENTS of Fortymile Creek at Banff, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 3.....	H. C. Ritchie.....	25.0	34.60	0.73	2.51	25
Jan. 15.....	do	24.0	32.60	0.81	2.51	26
Jan. 27.....	do	23.0	30.20	0.46	2.95	14
Feb. 13.....	do	25.0	34.60	0.79	2.51	27
Feb. 28.....	do	24.5	32.00	0.79	2.41	25
Mar. 13.....	do	24.5	32.50	0.90	2.42	29
Mar. 28.....	do	24.5	39.70	0.60	2.67	24
April 4.....	do	24.5	30.05	0.81	2.40	24
April 18.....	do	25.0	33.10	0.90	2.49	29
May 5.....	do	27.2	50.90	1.54	3.05	79
May 19.....	do	32.5	67.80	2.46	3.62	167
June 2.....	do	32.5	84.25	2.64	4.04	223
June 16.....	do	32.5	135.38	3.28	5.64	146
June 29.....	do	32.5	91.37	2.60	4.26	237
July 14.....	do	32.5	99.75	2.27	4.54	226
July 27.....	do	30.5	59.60	2.06	3.35	123
Aug. 11.....	do	28.5	51.30	1.76	3.04	91
Aug. 24.....	do	27.5	47.60	1.60	2.99	76
Sept. 15.....	do	27.5	43.60	1.42	2.78	62
Oct. 1.....	do	28.3	48.60	1.68	2.95	81
Oct. 13.....	do	28.0	47.60	1.56	2.94	75
Oct. 31.....	do	28.0	44.80	1.30	2.75	58
Nov. 9.....	do	27.0	44.40	1.18	2.75	52
Nov. 24.....	do	26.5	41.25	0.93	2.64	38
Dec. 8.....	do	25.5	35.03	0.60	2.40	21
Dec. 28.....	do	24.5	35.70	0.78	2.50	28

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Fortymile Creek at Banff, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.09	25.0a	2.60	22	2.49	25	2.36	20	2.80	60	3.80	183
2.....	2.09	25.0	2.78	21	2.48	26	2.36	20	2.87	67	4.36	262
3.....	2.65	25.0	2.71	18	2.49	26	2.37	21	2.98	79	5.11	369
4.....	2.65	25.0	2.62	16	2.49	26	2.39	22	3.03	85	5.36	406
5.....	2.66	25.0	2.62	15	2.50	27	2.41	24	2.95	76	5.10	368
6.....	2.67	26.0	2.72	15	2.42	27	2.42	25	2.91	71	5.85	476
7.....	2.68	26.0	2.78	16	2.44	27	2.42	25	2.87	67	4.70	312
8.....	2.67	26.0	2.82	17	2.45	28	2.43	25	2.96	77	4.40	269
9.....	2.66	26.0	2.90	20	2.43	28	2.43	25	2.97	78	4.25	247
10.....	2.65	26.0	2.90	24	2.45	28	2.43	25	2.98	79	4.05	218
11.....	2.65	26.0	2.90	26	2.43	29	2.44	26	3.00	81	4.03	215
12.....	2.63	26.0	2.60	27	2.43	29	2.45	27	3.00	81	4.20	240
13.....	2.62	26.0	2.53	27	2.45	29	2.46	28	3.20	105	4.30	254
14.....	2.59	26.0	2.53	27	2.45	30	2.46	28	3.30	117	4.80	326
15.....	2.50	26.0	2.54	27	2.44	30	2.46	28	3.65	162	5.20	382
16.....	2.58	26.0	2.55	26	2.45	30	2.47	29	3.75	176	5.60	440
17.....	2.58	26.0	2.55	24	2.44	30	2.47	29	3.68	166	5.90	483
18.....	2.57	26.0	2.52	22	2.45	30	2.48	29	3.62	159	5.70	454
19.....	2.56	26.0	2.50	23	2.44	31	2.49	30	3.55	149	5.60	440
20.....	2.85	25.0	2.49	23	2.43	31	2.52	33	3.55	149	5.20	382
21.....	2.78	24.0	2.48	23	2.44	31	2.52	33	3.45	136	4.93	344
22.....	2.61	23.0	2.48	23	2.44	31	2.51	32	3.45	136	4.25	247
23.....	2.42	21.0	2.48	24	2.43	31	2.52	33	3.58	153	4.15	232
24.....	2.25	18.5	2.48	24	2.41	31	2.53	34	3.71	170	4.15	232
25.....	2.15	16.0	2.47	24	2.63	30	2.55	35	3.90	197	4.20	240
26.....	2.15	14.0	2.49	24	2.65	28	2.55	35	3.83	187	4.15	232
27.....	2.90	13.9	2.44	25	2.41	25	2.55	35	3.65	162	4.10	225
28.....	2.90	15.0	2.41	25	2.40	24	2.56	36	3.60	156	4.15	232
29.....	2.92	16.5	.....	.....	2.45	24	2.57	37	3.45	136	4.25	236
30.....	2.98	18.0	.....	.....	2.38	24	2.65	45	3.55	123	4.35	246
31.....	2.65	20.0	.....	.....	2.37	22a	.....	.....	3.45	136	.....	.....

a Ice conditions Jan. 1 to March 31.

DAILY GAUGE HEIGHT AND DISCHARGE of Fortymile Creek at Banff, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	4.72	295	3.23	109	2.70	50	2.85	65	2.75	55	2.50	36.0
2.....	4.90	317	3.23	109	2.68	48	2.83	63	2.75	55	2.46	33.0
3.....	5.15	350	3.23	109	2.68	48	2.83	63	2.75	55	2.65	38.0
4.....	5.25	360	3.24	110	2.67	47	2.84	64	2.75	55	2.45	30.0
5.....	5.15	343	3.16	100	2.66	46	2.85	65	2.75	55	2.44	27.0
6.....	5.15	339	3.16	100	2.64	44	2.83	63	2.76	56	2.44	24.0
7.....	4.98	311	3.17	101	2.62	42	2.81	61	2.75	55	2.40	23.0
8.....	4.65	260	3.14	98	2.64	44	2.81	61	2.74	54	2.40	21.0
9.....	4.46	230	3.13	97	2.66	46	2.89	69	2.73	53	2.68	20.0
10.....	4.46	226	3.05	87	2.64	44	2.90	70	2.74	54	2.51	19.0
11.....	4.38	210	3.02	83	2.75	55	2.87	67	2.73	53	2.75	18.0
12.....	4.45	218	3.00	81	2.75	55	2.85	65	2.74	54	2.67	17.5
13.....	4.53	228	3.00	81	2.74	54	2.82	62	2.75	55	2.70	17.0
14.....	4.45	213	3.01	82	2.78	58	2.85	65	2.73	53	2.70	17.0
15.....	4.40	211	2.99	80	2.69	49	2.87	67	2.45	27	2.85	17.0
16.....	4.05	167	3.00	81	2.65	45	2.90	70	2.40	23	2.95	17.5
17.....	3.85	143	2.93	73	2.65	45	2.93	73	2.41	24	3.00	18.0
18.....	3.75	134	2.90	70	2.67	47	2.94	74	2.44	26	3.05	18.0
19.....	3.75	139	2.87	67	2.73	53	2.92	72	2.51	32	3.10	19.0
20.....	3.85	158	2.85	65	2.75	55	2.87	67	2.51	32	3.00	22.0
21.....	3.70	142	2.84	64	2.75	55	2.86	66	2.50	31	2.67	24.0
22.....	3.65	141	2.82	62	2.77	57	2.85	65	2.65	38a	2.50	24.0
23.....	3.60	138	2.81	61	2.75	55	2.83	63	2.64	38	2.49	25.0
24.....	3.55	136	2.99	80	2.76	56	2.81	61	2.65	38	2.51	26.0
25.....	3.50	134	2.75	55	2.80	60	2.80	60	2.65	38	2.58	26.0
26.....	3.35	117	2.74	54	2.83	63	2.79	59	2.65	38	2.56	27.0
27.....	3.33	123	2.75	55	2.87	67	2.78	58	2.64	38	2.55	27.0
28.....	3.31	118	2.75	55	2.92	72	2.76	56	2.64	38	2.50	28.0
29.....	3.26	112	2.73	53	2.86	66	2.75	55	2.64	38	2.50	29.0
30.....	3.24	110	2.71	51	2.85	65	2.75	55	2.60	38	2.49	29.0
31.....	3.23	109	2.72	52	.....	.....	2.75	55	.....	.....	2.49	30.0a

a Ice conditions Nov. 22 to Dec. 31.

MONTHLY DISCHARGE of Fortymile Creek at Banff, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	26	13.9	23.0	0.365	0.42	1,414
February.....	27	15.0	22.4	0.356	0.37	1,244
March.....	31	22.0	28.0	0.445	0.51	1,722
April.....	45	20.0	29.1	0.462	0.51	1,732
May.....	197	60.0	122.0	1.940	2.24	7,501
June.....	483	183.0	306.0	4.850	5.41	18,208
July.....	360	109.0	201.0	3.190	3.68	12,359
August.....	110	51.0	78.2	1.240	1.43	4,808
September.....	72	42.0	53.0	0.841	0.94	3,154
October.....	74	55.0	63.8	1.020	1.18	3,923
November.....	56	25.0	43.3	0.687	0.77	2,576
December.....	38	17.0	24.1	0.383	0.44	1,482
The year.....	17.90	60,123

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BOW RIVER AT BANFF.

Location.—On the SE. $\frac{1}{4}$ Sec. 35, Tp. 25, Rge. 12, W. 5th Mer., at the highway bridge at Banff.

Records available.—May 25, 1909, to November 11, 1909. April 26, 1910, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 92.36 feet during 1909-12; 93.53 feet during 1913; and 93.38 feet during 1914.

Bench-mark.—Permanent iron bench-mark on the right bank; assumed elevation, 100.00 feet.

Channel.—Gravel and boulders, deep hole with backwater near right bank.

Discharge measurements.—Made from bridge.

Winter flow.—This station is entirely free from the backwater effect of ice, and one discharge curve is used throughout the year.

Observer.—N. B. Sanson.

DISCHARGE MEASUREMENTS of Bow River at Banff, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 12.....	H. C. Ritchie.....	54.0	173	2.27	0.71	393
Jan. 26.....	do.....	54.0	162	2.15	0.60	349
Feb. 10.....	do.....	54.0	159	2.12	0.57	338
Feb. 23.....	do.....	53.5	153	1.88	0.43	289
Mar. 9.....	do.....	75.6	169	1.62	0.29	274
Mar. 21.....	do.....	79.0	167	1.64	0.30	273
April 3.....	do.....	83.5	173	1.79	0.44	309
April 21.....	do.....	121.0	494	0.82	0.70	407
May 6.....	do.....	232.0	703	1.34	1.38	941
May 21.....	do.....	292.0	929	2.12	2.10	1,975
June 3.....	do.....	319.0	1,356	3.80	3.46	5,152
June 17.....	do.....	320.5	1,602	4.59	4.15	7,349
July 15.....	do.....	320.5	1,466	4.10	3.83	6,015
July 29.....	do.....	309.0	1,097	2.78	2.62	3,055
Aug. 14.....	do.....	306.0	1,017	2.49	2.35	2,528
Aug. 28.....	do.....	297.0	981	2.26	2.24	2,221
Sept. 19.....	do.....	289.0	890	1.87	1.92	1,662
Oct. 2.....	do.....	292.0	886	1.73	1.94	1,535
Oct. 17.....	do.....	274.0	794	1.47	1.62	1,169
Oct. 26.....	do.....	246.0	721	1.18	1.35	854
Nov. 10.....	do.....	236.0	673	1.06	1.15	710
Nov. 27.....	do.....	172.0	601	1.03	0.99	616
Dec. 12.....	do.....	72.0	172	1.71	0.47	293
Dec. 21.....	do.....	54.5	174	2.03	0.63	353

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River, at Banff, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.64	386	0.51 ^a	324	0.37	289	0.35	285	1.39	915	2.40	2,580
2.....	0.64	386	0.49	318	0.37	289	0.35	285	1.68	1,273	2.75	3,360
3.....	0.64	386	0.46	310	0.38	291	0.43	303	2.00	1,780	3.43	5,081
4.....	0.67 ^a	390	0.49	318	0.37	289	0.44	305	1.93	1,661	3.88	6,332
5.....	0.69	395	0.47	312	0.37	289	0.46	310	1.74	1,360	3.40	5,000
6.....	0.71	400	0.47	312	0.37	289	0.51	324	1.67	1,259	3.42	5,054
7.....	0.66	379	0.47	312	0.36	287	0.50	320	1.32	841	3.43	5,081
8.....	0.63	377	0.52	327	0.37	289	0.53	330	1.37	893	3.23	4,548
9.....	0.60	355	0.57	344	0.37	289	0.55	338	1.59	1,153	2.95	3,840
10.....	0.51	324	0.57	344	0.25	268	0.55	338	1.67	1,259	2.84	3,576
11.....	0.70	395	0.56	341	0.29	274	0.58	348	1.68	1,273	2.95	3,840
12.....	0.62	363	0.56	341	0.27	270	0.73	410	1.72	1,330	3.13	4,288
13.....	0.64	371	0.57	344	0.28	272	0.76	425	1.83	1,498	3.30	4,730
14.....	0.62	363	0.55	338	0.29 ^a	273	0.80	445	1.97	1,729	3.53	5,354
15.....	0.61	359	0.54	334	0.30 ^a	275	0.75	410	2.28	2,329	3.79	6,091
16.....	0.62	363	0.53	330	0.31 ^a	277	0.80	445	2.48	2,748	4.05	6,850
17.....	0.58	348	0.48	315	0.32 ^a	279	0.77	430	2.43	2,643	4.19	7,270
18.....	0.57 ^a	344	0.48	315	0.33 ^a	281	0.74	415	2.32	2,412	4.29	7,570
19.....	0.56	341	0.47	312	0.34 ^a	283	0.67	388	2.25	2,267	4.19	7,270
20.....	0.45	308	0.39	293	0.35 ^a	285	0.78	435	2.16	2,087	3.89	6,381
21.....	0.57	344	0.41	298	0.40	295	0.73	410	2.08	1,932	3.64	5,662
22.....	0.52	327	0.43	303	0.44	305	0.69	391	2.10	1,970	3.34	4,838
23.....	0.47	313	0.37	289	0.45	308	0.71	400	2.20	2,165	3.07	4,135
24.....	0.41	298	0.40	295	0.40	295	0.85	475	2.38	2,538	2.85	3,600
25.....	0.60 ^a	355	0.35	285	0.16	258	0.85	475	2.55	2,900	2.95	3,840
26.....	0.48	315	0.40	295	0.08	255	0.82	457	2.46	2,706	3.12	4,262
27.....	0.45	308	0.39	293	0.28	272	0.79	440	2.30	2,370	3.02	4,010
28.....	0.43	303	0.37	289	0.36	287	0.85	475	2.20	2,165	3.08	4,160
29.....	0.48	315	.....	.....	0.49	318	0.92	519	2.08	1,932	3.14	4,314
30.....	0.48	315	0.43	303	1.09	642	2.02	1,818	3.30	4,730
31.....	0.53	330	0.41	298	2.13	2,028

^a Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Banff, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.54	5,382	2.71	3,264	2.07	1,913	1.84	1,514	1.24	766	0.63	367
2.....	3.77	6,033	2.82	3,528	2.03	1,837	1.94	1,678	1.27	793	0.78	435
3.....	3.97	6,613	2.79	3,456	2.02	1,818	1.89	1,594	1.26	784	0.79	440
4.....	4.12	7,060	2.83	3,552	2.05	1,875	1.82	1,482	1.24	766	0.69	391
5.....	4.07	6,910	2.69	3,217	2.04	1,856	1.75	1,375	1.25	775	0.63	367
6.....	4.04	6,820	2.68	3,194	1.93	1,661	1.74	1,360	1.22	748	0.30 _a	275
7.....	3.91	6,439	2.68	3,194	1.94	1,678	1.73	1,345	1.12	666	0.90	253
8.....	3.76	6,004	2.63	3,079	1.94	1,678	1.87	1,562	1.20	730	0.49	318
9.....	3.63	5,634	2.40	2,580	1.90	1,610	1.97	1,729	1.18	714	0.38	291
10.....	3.58	5,494	2.34	2,454	1.78	1,420	1.90	1,610	1.14	682	0.37	289
11.....	3.57	5,466	2.30	2,370	1.79	1,435	1.84	1,514	1.14	682	0.38	291
12.....	3.62	5,606	2.26	2,288	1.81	1,466	1.76	1,390	1.13	674	0.47	312
13.....	3.82	6,178	2.29	2,350	1.73	1,345	1.74	1,360	1.03	597	0.46	310
14.....	3.77	6,033	2.33	2,433	1.65	1,233	1.68	1,273	0.80	445	0.52	327
15.....	3.82	6,178	2.36	2,496	1.60	1,165	1.65	1,233	0.75	420	0.55	338
16.....	3.51	5,298	2.34	2,454	1.53	1,078	1.63	1,205	0.50	320	0.55	338
17.....	3.28	4,678	2.45	2,685	1.50	1,040	1.62	1,192	0.00	253	0.37	344
18.....	3.16	4,366	2.32	2,412	1.53	1,078	1.64	1,219	0.00	253	0.37	344
19.....	3.11	4,236	2.30	2,370	1.90	1,610	1.63	1,205	0.00	253	0.58	348
20.....	3.23	4,548	2.31	2,391	1.81	1,466	1.60	1,165	0.99	568	0.60 _a	355
21.....	3.16	4,366	2.35	2,475	1.70	1,300	1.54	1,090	1.01	583	0.63	367
22.....	2.88	3,672	2.45	2,685	1.63	1,205	1.48	1,017	0.97	554	0.65	375
23.....	2.67	3,171	2.33	2,433	1.60	1,165	1.41	936	0.94	533	0.69	391
24.....	2.66	3,148	2.27	2,308	1.62	1,192	1.41	936	0.96	547	0.71	400
25.....	2.64	3,102	2.21	2,186	1.66	1,246	1.38	904	1.02	590	0.74	415
26.....	2.66	3,148	2.18	2,126	1.76	1,390	1.35	872	1.06	620	0.75	420
27.....	2.59	2,988	2.18	2,126	2.05	1,875	1.33	852	1.00	575	0.74 _a	415
28.....	2.64	3,102	2.18	2,126	2.01	1,799	1.32	841	0.96	547	0.72	405
29.....	2.58	2,966	2.20 _a	2,165	1.80	1,450	1.27	793	0.94	533	0.72 _a	405
30.....	2.58	2,966	2.22	2,206	1.91	1,627	1.25	775	0.82	457	0.72 _a	405
31.....	2.64	3,102	2.14	2,048	.....	.....	1.25	775	.....	.....	0.72 _a	405

_a Gauge height interpolated.

MONTHLY DISCHARGE of Bow River at Banff, for 1914.

(Drainage area 893 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	400	298	350	0.392	0.45	21,521
February.....	344	285	315	0.353	0.37	17,494
March.....	318	255	285	0.320	0.37	17,524
April.....	642	285	399	0.447	0.50	23,742
May.....	2,900	841	1,846	2.070	2.39	113,506
June.....	7,570	2,580	4,922	5.510	6.15	292,880
July.....	7,060	2,966	4,861	5.440	6.27	298,800
August.....	3,552	2,048	2,602	2.910	3.36	159,980
September.....	1,913	1,040	1,484	1.660	1.85	88,310
October.....	1,729	775	1,219	1.370	1.53	74,950
November.....	793	253	581	0.651	0.73	34,572
December.....	440	253	359	0.402	0.46	22,074
The year.....	.....	.....	.....	.....	24.48	1,165,443

SPRAY RIVER AT SPRAY LAKES.

Location.—On the SE. $\frac{1}{4}$ Sec. 31, Tp. 22, Rge. 10, W. 5th Mer.

Records available.—July 23, 1914, to October 27, 1914.

Gauge.—Chain gauge on right bank.

Bench-mark.—On tree; elevation 11.48 feet above the zero of the gauge.

Channel.—Hard bottom; current very swift.

Discharge measurements.—Made by wading.

Observer.—Louis Mumford.

Remarks.—Not sufficient discharge measurements have been made to accurately determine the daily discharge; from July 23 to October 27 the discharge varied between 800 and 200 sec.-ft.

DISCHARGE MEASUREMENTS of Spray River at Spray Lakes, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 24	H. C. Ritchie	116.0	200	3.95	6.16	787
Sept. 1.	do	76.0	118	2.28	5.74	270

SPRAY LAKES OVERFLOW AT SPRAY LAKES.

Location.—On the SW. $\frac{1}{4}$ Sec. 32, Tp. 22, Rge. 10, W. 5th Mer.

Records available.—July 23, 1914, to October 27, 1914.

Gauge.—Vertical staff at left bank.

Bench-mark.—On tree; elevation 4.98 feet above the zero of the gauge.

Channel.—Clean gravel and sand.

Discharge measurements.—Made by wading.

Observer.—Louis Mumford.

Remarks.—Not sufficient discharge measurements have been made to accurately determine the daily discharge; from July 23 to October 27 the discharge varied between 105 and 47 sec.-ft.

DISCHARGE MEASUREMENTS of Spray Lakes Overflow at Spray Lakes, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 24	H. C. Ritchie	37.5	36.0	2.78	1.54	100
Sept. 1.	do	35.0	27.4	1.83	1.04	50

SPRAY RIVER NEAR BANFF.

Location.—On the S.W. $\frac{1}{4}$ Sec. 25, Tp. 25, Rge. 12, W. 5th Mer., at the highway bridge near the Canadian Pacific Railway Banff Springs Hotel, near the junction of the stream with the Bow River.

Records available.—July 15, 1910, to December 31, 1914.

Gauge.—Chain on left bank; elevation of zero maintained at 93.29 feet during 1910-11. Elevation of zero maintained at 88.71 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark on the left bank; assumed elevation, 100.00 feet.

Channel.—Gravel, large boulders at left bank.

Discharge measurements.—Made from bridge.

Observer.—N. B. Sanson.

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DISCHARGE MEASUREMENTS of Spray River near Banff, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 15.	H. C. Ritchie	27.5	63.9	3.63	5.209	232
Jan. 28.	do	26.5	63.1	2.37	5.220	150
Feb. 11.	do	23.5	59.4	2.96	5.200	176
Feb. 24.	do	25.0	54.0	3.05	4.960	165
Mar. 7.	do	24.5	49.5	3.49	4.730	173
Mar. 26.	do	25.0	47.5	2.65	4.690	126
April 4.	do	37.5	51.0	3.30	4.680	168
April 17.	do	37.5	52.0	3.52	4.750	183
May 4.	do	114.0	109.0	4.43	5.500	484
May 19.	do	117.5	191.3	5.26	6.150	1,006
June 2.	do	118.5	227.1	5.83	6.420	1,325
June 16.	do	122.0	327.0	7.97	7.220	2,605
June 29.	do	118.5	228.0	6.55	6.540	1,494
July 27.	do	118.0	193.0	5.48	6.205	1,059
Aug. 11.	do	118.0	169.0	4.92	6.000	832
Aug. 24.	do	116.0	145.0	4.41	5.720	640
Sept. 16.	do	108.0	105.0	3.81	5.395	401
Sept. 28.	do	116.0	135.0	4.17	5.670	563
Oct. 23.	do	125.0	116.0	3.93	5.580	491
Nov. 9.	do	104.0	101.0	3.84	5.330	390
Nov. 23.	do	52.5	81.2	3.83	5.100	311
Dec. 7.	do	34.5	90.3	2.62	5.620	236

DAILY GAUGE HEIGHT AND DISCHARGE of Spray River near Banff, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	5.25	195a	.....	178	.....	169	4.76	186	5.12	290	6.19	1,039
2.	5.43	194	4.85	183	4.77	170	4.72	176	5.36	394	6.40	1,300
3.	5.49	194	4.85	177	4.75	170	4.63	158	5.43	430	6.93	2,110
4.	.....	202	4.84	168	4.74	171	4.66	164	5.50	468	7.27	2,684
5.	5.53	208	4.90	160	4.64	172	4.64	160	5.47	452	7.10	2,395
6.	5.32	214	4.84	150	4.65	172	4.63	158	5.42	425	6.90	2,060
7.	5.20	220	4.95	142	4.73	173	4.60	152	5.40	414	6.80	1,900
8.	5.19	227	.....	164	.....	174	4.60	152	5.49	467	6.70	1,745
9.	5.08	220	5.18	174	4.76	175	4.61	154	5.58	516	6.60	1,590
10.	5.02	214	5.10	170	4.63	176	4.60	152	5.62	541	6.51	1,455
11.	.....	220	5.19	176	4.66	176	4.60	152	5.65	562	6.47	1,398
12.	.....	224	5.08	174	4.73	177	4.63	158	5.66	568	6.58	1,560
13.	5.27	231	5.00	172	4.74	178	4.66	164	5.73	617	6.74	1,807
14.	5.12	224	4.96	168	4.71	176	4.71	174	5.84	702	6.90	2,060
15.	5.25	232	.....	169	.....	177	4.70	172	6.04	880	7.05	2,310
16.	5.03	208	4.98	170	4.72	178	4.75	184	6.12	962	7.22	2,599
17.	4.99	202	4.92	166	4.70	176	4.74	180	6.18	1,028	7.30	2,735
18.	.....	205	4.93	168	4.71	176	4.73	178	6.23	1,086	7.40	2,905
19.	5.21	208	4.89	165	4.71	176	4.78	190	6.16	1,006	7.48	3,041
20.	4.91	180	4.75	160	4.77	180	4.83	203	6.13	973	7.35	2,820
21.	4.99	181	4.75	160	4.76	180	4.76	186	6.04	880	7.10	2,395
22.	5.03	182	.....	161	.....	170	4.76	186	6.07	910	6.84	1,964
23.	5.01	188	4.85	162	4.56	160	4.78	190	6.09	930	6.64	1,652
24.	5.19	178	4.96	165	4.56	152	4.80	195	6.16	1,006	6.52	1,470
25.	.....	170	4.81	166	4.59	140	4.82	200	6.32	1,196	6.56	1,530
26.	5.26	162	4.80	167	4.65	126	4.82	200	6.32	1,196	6.54	1,500
27.	5.00	156	4.77	168	4.86	134	4.83	203	6.21	1,062	6.32	1,470
28.	5.25	150	4.74	168	4.86	143	4.85	208	6.10	940	6.34	1,500
29.	5.25	153	.....	.....	.....	150	4.89	218	6.08	920	6.57	1,545
30.	5.10	159	.....	.....	4.71	160	4.96	238	6.00	840	6.68	1,714
31.	5.05	166	.....	.....	4.69	170a	.....	.....	.....	.....	.....	.....

a Ice conditions Jan. 1 to March 31.

DAILY GAUGE HEIGHT AND DISCHARGE of Spray River near Banff, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	6.86	1,996	6.18	1,028	5.63	548	5.61	535	5.46	446	4.86	211
2.....	6.90	2,060	6.17	1,017	5.62	541	5.59	522	5.46	446	5.10	216b
3.....	7.06	2,327	6.15	995	5.54	492	5.59	522	5.44	436	5.13	225
4.....	7.20	2,565	6.12	962	5.55	498	5.59	522	5.42	425	5.22	233
5.....	7.15	2,480	6.10	940	5.56	504	5.59	522	5.42	425	5.25	238
6.....	7.10	2,395	6.10	940	5.54	492	5.56	504	5.37	399	.....	240
7.....	7.00	2,225	6.10	940	5.51	474	5.57	510	5.36	394	5.69	236
8.....	7.03	2,276	6.08	920	5.51	474	5.74	625	5.35	389	5.84	230
9.....	6.90	2,060	6.05	890	5.50	468	5.72	610	5.34	385	5.88	220
10.....	6.92	2,093	6.04	880	5.44	436	5.69	588	5.31	370	6.00	200
11.....	6.85	1,980	6.02	860	5.51	474	5.66	568	5.30	365	6.18	175
12.....	6.90	2,060	6.00	840	5.48	458	5.63	548	5.29	361	6.20	150
13.....	6.95	2,142	5.97	813	5.45	441	5.58	516	5.27	351	.....	153
14.....	7.00	2,225	5.92	768	5.43	430	5.58	516	5.16	305	6.36	160
15.....	6.95	2,142	5.87	726	5.43	430	5.61	535	5.08	276	.....a	155
16.....	6.89	2,044	5.87	726	5.39	409	5.69	588	4.99	247	.....	150
17.....	6.60	1,590	5.86	718	5.39	409	5.74	625	5.06	269	.....	158
18.....	6.54	1,500	5.84	702	5.39	409	5.74	625	5.13	293	.....	165
19.....	6.52	1,470	5.82	686	5.66	568	5.74	625	5.18	312	.....	155
20.....	6.53	1,485	5.80	670	5.61	535	5.69	588	5.16	305	.....	158
21.....	6.52	1,470	5.79	662	5.56	504	5.67	575	5.19	316	.....	160
22.....	6.51	1,455	5.79	662	5.58	516	5.61	535	5.10	282	.....	165
23.....	6.29	1,158	5.78	655	5.51	474	5.58	516	5.13	293	.....	175
24.....	6.29	1,158	5.78	655	5.53	486	5.56	504	5.13	293	.....	165
25.....	6.28	1,146	5.76	640	5.57	510	5.54	492	5.12	288	.....	160
26.....	6.24	1,098	5.76	640	5.63	548	5.51	474	5.11	286	.....	160
27.....	6.21	1,062	5.74	625	5.65	562	5.50	468	5.06	269	.....	165
28.....	6.20	1,050	5.74	625	5.67	575	5.46	446	5.10	282	.....	170
29.....	6.20	1,050	5.72	610	5.64	555	5.43	430	5.01	253	.....	175
30.....	6.18	1,028	5.68	582	5.60	528	5.45	441	4.92	227	.....	180
31.....	6.18	1,028	5.65	562	.....	.....	5.47	452	.....	.....	.....	190b

a Ice jam.

b Ice conditions Dec. 2 to 31.

MONTHLY DISCHARGE of Spray River near Banff, for 1914.

(Drainage area 301 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	231	150	196	0.651	0.75	12,052
February.....	183	142	167	0.555	0.58	9,275
March.....	180	126	167	0.555	0.64	10,268
April.....	238	152	180	0.598	0.67	10,711
May.....	1,196	290	755	2.510	2.89	46,423
June.....	3,041	1,039	1,942	6.450	7.20	115,560
July.....	2,565	1,028	1,736	5.770	6.65	106,740
August.....	1,028	562	772	2.560	2.95	47,468
September.....	575	490	491	1.630	1.82	29,217
October.....	625	430	533	1.770	2.04	32,773
November.....	446	227	333	1.110	1.24	19,815
December.....	240	150	183	0.608	0.70	11,252
The year.....	.....	.....	.....	.....	28.13	451,554

SESSIONAL PAPER No. 25c

CASCADE RIVER AT BANKHEAD.

Location.—On the SE. $\frac{1}{4}$ Sec. 19, Tp. 26, Rge. 11, W. 5th Mer., at the Bankhead Mines.

Records available.—August 16, 1911, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 93.49 feet since establishment.

Bench-mark.—Tree stump on left bank; assumed elevation, 100.00 feet.

Channel.—Coarse gravel.

Discharge measurements.—Made from foot bridge; bridge replaced October 30 by one 50 feet downstream.

Artificial control.—This station is two and one-half miles below the reservoir of the Calgary Power Company at Lake Minnewanka, and the flow of the stream is controlled by the gates.

Observer.—J. B. Mackinlay.

DISCHARGE MEASUREMENTS of Cascade River at Bankhead, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 2.....	H. C. Ritchie.....	52.5	126.0	2.71	2.52	341.0
Jan. 13.....	do	52.0	104.0	1.99	2.10	207.0
Jan. 28.....	do	52.0	143.0	1.08	3.25	155.0
Feb. 28.....	do	52.0	81.8	1.09	1.59	89.0
Mar. 10.....	do	52.0	79.2	1.05	1.58	83.0
Mar. 27.....	do	52.0	95.6	1.57	1.90	150.0
April 6.....	do	52.0	90.2	1.45	1.76	131.0
April 25.....	do	34.0	51.6	0.35	1.10	18.0
May 5.....	do	50.0	128.0	3.26	2.65	415.0
May 18.....	do	32.5	45.7	0.14	0.95	6.8
June 1.....	do	32.0	43.7	0.16	0.90	7.1
June 15.....	do	54.0	183.8	5.68	3.72	1,044.0
July 28.....	do	45.0	66.5	3.45	1.46	230.0
Aug. 10.....	do	45.0	76.0	4.01	1.72	305.0
Aug. 24.....	do	43.7	49.3	2.26	1.07	111.0
Sept. 12.....	do	32.0	30.2	1.60	0.65	49.0
Oct. 1.....	do	43.3	48.0	2.89	1.20	139.0
Oct. 14.....	do	45.0	62.8	3.09	1.48	194.0
Oct. 30.....	do	43.0a	68.2	2.66	1.51	181.0
Nov. 14.....	do	43.0	62.6	2.48	1.30	156.0
Nov. 24.....	do	43.5	70.6	2.96	1.46	209.0
Dec. 11.....	do	42.3	60.3	2.66	1.25	161.0
Dec. 30.....	do	41.8	56.4	2.36	1.15	133.0

a Measurements on and after October 30 made at new bridge 50 feet downstream.

DAILY GAUGE HEIGHT AND DISCHARGE of Cascade River at Bankhead, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.60	372	2.19	180	1.55	79	1.82	133.0	0.84	2.6	0.91	5.1
2.....	2.52	340	2.55	180	1.54	77	1.81	130.0	0.97	9.2	0.93	6.8
3.....	2.47	322	3.35	167	1.54	77	1.78	124.0	1.21	29.0	2.30	275.0
4.....	2.42	310	3.52	142	1.54	77	1.78	124.0	1.23	32.0	3.65	997.0
5.....	2.38	290	3.58	126	1.56	81	1.79	126.0	2.65	414.0	4.28	1,400.0
6.....	2.34	284	3.81	108	1.58	84	1.76	120.0	2.56	376.0	4.12	1,298.0
7.....	2.30	273	3.59	88	1.55	79	1.76	120.0	2.50	351.0	4.06	1,259.0
8.....	2.27	263	3.25	70	1.56	81	1.76	120.0	2.45	331.0	4.00	1,221.0
9.....	2.26	259	3.23	70	1.55	79	1.75	117.0	2.48	343.0	3.85	1,125.0
10.....	2.21	242	3.04	72	1.58	84	1.75	117.0	2.46	335.0	3.75	1,061.0
11.....	2.17	230	2.90	74	1.58	84	1.73	113.0	2.42	320.0	3.68	1,016.0
12.....	2.14	220	2.53	75	1.56	81	1.73	113.0	2.40	312.0	2.97	571.0
13.....	2.10	207	2.29	77	1.56	81	1.73	113.0	1.93	159.0	3.08	636.0
14.....	2.10	207	1.90	77	1.57	83	1.73	113.0	1.10	18.0	3.19	704.0
15.....	2.06	197	1.72	79 ^b	1.58	84	1.73	113.0	1.10	18.0	4.03	1,240.0
16.....	2.04	195	1.57	81	1.58	84	1.73	113.0	0.98	9.8	4.19	1,343.0
17.....	2.08	202	1.53	75	1.62	92	1.73	113.0	1.00	11.0	4.10	1,285.0
18.....	2.00	180	1.52	74	1.61	90	1.72	111.0	1.01	11.1	4.05	1,253.0
19.....	1.99	177	1.50	70	1.61	90	1.74	115.0	0.96	8.6	3.90	1,157.0
20.....	2.05	177	1.55	72	1.63	94	1.76	120.0	2.43	324.0	3.70	1,029.0
21.....	2.18	172	1.68	72	1.61	90	1.76	120.0	2.44	328.0	3.55	980.0
22.....	1.96	167	1.62	73	1.61	90	0.97	9.2	0.89	5.0	3.30	870.0
23.....	2.21	164	1.55	75	1.61	90	0.97	9.2	0.89	5.0	3.18	840.0
24.....	2.61	162	1.53	75	1.64	96	1.03	13.0	0.88	4.2	3.10	835.0
25.....	2.40	159	1.54	77	1.86	142	1.06	15.2	0.88	4.2	3.00	820.0
26.....	2.56	157	1.55	79	1.95	164	1.15 ^a	23.0	0.94	7.4	2.90	805.0
27.....	2.90 ^a	157	1.51	74	1.90	151	1.24	33.0	0.95	8.0	2.88	835.0
28.....	3.25	155	1.91	86	1.89	149	1.26	35.0	0.90	5.0	2.80	820.0
29.....	3.67	159 ^b	.....	.....	1.86	142	1.31	41.0	0.90	5.0	2.43	642.0
30.....	3.50	164	.....	.....	1.84	137	1.35	47.0	0.89	5.0	1.90	381.0
31.....	3.25	170	1.83	135	0.90	5.0

^a Gauge height interpolated.^b Ice conditions Jan. 29 to Feb. 15.

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DAILY GAUGE HEIGHT AND DISCHARGE of Cascade River at Bankhead, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height	Discharge	Gauge Height.	Discharge	Gauge Height.	Discharge	Gauge Height.	Discharge	Gauge Height.	Discharge	Gauge Height.	Discharge
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.25	548	0.65	47	0.65	47	1.20	137	1.48	218	1.38	187
2.....	2.26	553	0.65	47	0.65	47	0.92	82	1.48	218	1.35	177
3.....	2.38	615	1.66	282	0.65	47	1.07	109	1.54	258	1.33	172
4.....	2.58	726	1.68	289	0.67	49	1.13	122	1.47	214	1.34	175
5.....	2.72	806	1.71	301	0.71	53	1.16	128	1.53	234	1.32	169
6.....	2.80	852	1.76	322	0.95	87	1.23	145	1.49	221	1.30	163
7.....	2.80	852	1.71	301	0.98	93	1.28	160	1.48	218	1.29	160
8.....	2.05	450	1.71	301	0.65	47	1.38	186	1.40	192	1.28	158
9.....	2.50	681	1.74	313	0.64	47	1.34	175	1.40	192	1.27	155
10.....	3.07	1,014	1.72	305	0.64	47	1.36	180	1.39	189	1.25	150
11.....	3.04	995	1.73	309	0.64	47	1.43	202	1.42	198	1.25	150
12.....	3.00	971	1.74	313	0.63	46	1.45	208	1.43	202	1.25	150
13.....	2.95	941	1.70	297	0.71	53	1.43	202	1.44	205	1.23	145
14.....	2.95	941	1.70	297	0.75	58	1.48	218	1.30	163	1.23	145
15.....	2.71	800	1.20	137	0.84	70	1.46	211	1.65	278	1.41	195
16.....	2.76	829	1.28	159	0.90	79	1.52	231	1.54	238	1.99	422
17.....	2.65	765	1.35	177	0.93	84	1.56	245	1.74	313	1.34	175
18.....	2.55	709	1.38	188	0.69	51	1.59	254	1.66	288	1.34	175
19.....	2.53	698	0.50	36	0.76	59	1.59	254	1.66	288	1.22	142
20.....	2.54	703	0.50	36	0.85	72	1.59	254	1.64	274	1.20	137
21.....	2.47	664	0.55	40	0.93	84	1.59	254	1.59	254	1.17	130
22.....	2.43	642	0.67	49	0.78	62	1.60	259	1.52	231	1.14	124
23.....	1.74	313	0.80	64	0.84	70	1.57	248	1.51	228	1.14	124
24.....	1.76	322	0.89	77	0.89	77	1.58	252	1.46	211	1.17	130
25.....	1.78	330	1.07	109	0.98	93	1.59	254	1.46	211	1.16	128
26.....	1.81	342	1.04	104	0.49	36	1.55	242	1.46	211	1.14	124
27.....	1.80	338	1.17	130	0.60	43	1.55	242	1.46	211	1.15	126
28.....	1.80	338	0.76	59	1.57	248	1.55	242	1.44	205	1.15	126
29.....	1.47	214	0.95	87	1.50	224	1.50	224	1.42	198	1.15	126
30.....	1.48	218	1.05	106	1.05	106	1.50	224	1.40	192	1.15	126
31.....	1.47	214	0.68	50	.....	.....	1.51	228	.....	.....	1.14	124

MONTHLY DISCHARGE of Cascade River at Bankhead, for 1914.

(Drainage area 248 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	372	155.0	217	0.875	1.01	13,343
February.....	180	70.0	92	0.370	0.38	5,093
March.....	164	77.0	98	0.396	0.46	6,044
April.....	133	9.2	90	0.364	0.41	5,379
May.....	414	2.6	122	0.492	0.57	7,501
June.....	1,400	5.1	89	3.590	4.00	52,958
July.....	1,014	214.0	625	2.520	2.90	38,430
August.....	322	36.0	172	0.694	0.80	10,576
September.....	248	36.0	74	0.299	0.33	4,415
October.....	259	82.0	206	0.831	0.96	12,666
November.....	313	163.0	224	0.903	1.01	13,329
December.....	422	124.0	158	0.637	0.73	9,715
The year.....	.....	.....	.....	.....	13.56	179,449

BOW RIVER NEAR KANANASKIS.

Location.—On the NW. $\frac{1}{4}$ Sec. 32, Tp. 24, Rge. 8, W. 5th Mer., at the Canadian Pacific Railway bridge, one mile above the Kananaskis Falls dam of the Calgary Power Company.

Records available.—March 10, 1912, to December 31, 1914. Records obtained at Morley, ten miles downstream, from May 25, 1910, to November 30, 1911.

Gauge.—Chain; elevation of zero maintained at 90.84 feet since establishment.

Bench-mark.—On side of east pier; assumed elevation, 100.00 feet.

Channel.—Solid rock, fairly uniform.

Discharge measurements.—Made from bridge; at very low stages by wading.

Observer.—The Calgary Power Company.

DISCHARGE MEASUREMENTS of Bow River near Kananaskis, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 6.....	H. C. Ritchie.....	293	478	2.41	3.97	1,155
Jan. 20-21.....	do.....	310	592	1.05	4.80	624
Feb. 2.....	do.....	263	315	2.26	4.00	710
Feb. 7.....	do.....	293	327	2.19	3.65	718
Mar. 3.....	do.....	283	297	2.09	2.16	620
Mar. 17.....	do.....	357	424	1.58	2.42	670
Mar. 31.....	do.....	360	431	1.59	2.43	688
April 14.....	do.....	350	314	2.74	1.91	860
April 29.....	do.....	352	321	2.76	1.88	885
May 12.....	do.....	375	535	4.22	2.42	2,256
May 27.....	do.....	399	724	5.57	2.91	4,032
June 9.....	do.....	412	1,004	6.86	3.65	6,888
June 23.....	do.....	414	1,072	7.35	3.81	7,878
July 7.....	do.....	420	1,230	8.01	4.25	9,844
Aug. 4.....	do.....	402	784	6.21	3.12	4,870
Sept. 8.....	do.....	385	569	4.33	2.46	2,465
Sept. 22.....	do.....	380	499	3.76	2.37	1,873
Oct. 7.....	do.....	380	505	3.85	2.38	1,943
Oct. 19.....	do.....	383	546	3.98	2.42	2,172
Nov. 3.....	do.....	377	478	3.43	2.24	1,641
Dec. 1.....	do.....	358	461	2.14	2.33	986
Dec. 15.....	do.....	241	350	1.24	3.46	433

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Kananaskis, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	5.36	1,260 ^a	4.36	740	2.41	605	2.46	700	2.04	1,168	2.62	2,872
2.....	5.54	1,240	4.21	730	2.15	610	2.45	705	2.04	1,168	2.71	3,198
3.....	5.47	1,220	4.00	710	2.25	620	2.26	710	2.25	1,675	3.11	4,781
4.....	4.92	1,200	4.10	660	2.10	625	2.25	720	2.25	1,675	3.90	8,260
5.....	4.52	1,170	3.73	590	2.20	630	2.47	730	2.40	2,120	3.90	8,260
6.....	3.96	1,155	3.90	580	2.10	640	2.36	740	2.45	2,285	3.91	8,306
7.....	3.56	1,130	3.89	580	2.36	650	2.39	745	2.35	1,965	3.71	7,386
8.....	3.35	1,100	3.95	600	2.26	660	2.30	750	2.36	1,996	3.70	7,340
9.....	3.32	1,070	3.89	640	2.30	665	2.31	760	2.43	2,219	3.65	7,115
10.....	3.39	1,040	3.92	680	2.20	675	2.40	770	2.43	2,219	3.30	5,570
11.....	4.02	1,000	3.95	700	2.30	680	2.25	790	2.35	1,965	3.32	5,656
12.....	4.12	960	3.94	720	2.25	675	1.95	815	2.38	2,058	3.33	5,699
13.....	4.55	910	3.94	730	3.05	655	1.94	840	2.45	2,285	3.27	5,444
14.....	4.74	860	3.84	740	3.54	640	1.91	860 ^a	2.43	2,219	3.55	6,665
15.....	4.89	810	3.95	740	3.42	645	1.91	900	2.42	2,186	3.75	7,570
16.....	4.90	760	3.84	735	3.05	655	1.92	920	2.42	2,186	4.25	9,870
17.....	5.00	720	3.60	720	2.70	670	1.90	880	2.66	3,016	4.35	10,330
18.....	4.97	680	3.59	680	2.40	680	1.95	980	2.69	3,124	4.37	10,422
19.....	4.90	650	3.41	620	2.61	760	1.85	790	2.73	3,274	4.30	10,100
20.....	4.80	625	3.55	560	2.33	710	1.90	880	2.76	3,388	4.20	9,640
21.....	4.80	620	3.37	560	2.30	720	1.91	900	2.73	3,274	3.95	8,490
22.....	4.95	615	3.35	565	2.32	730	1.85	790	2.60	2,800	3.85	8,030
23.....	4.94	610	3.40	570	2.46	740	1.80	700	2.65	2,980	3.75	7,570
24.....	5.03	605	3.44	575	2.35	740	1.86	808	2.67	3,052	3.36	5,828
25.....	4.95	600	3.70	580	2.37	730	1.88	844	2.83	3,657	3.35	5,785
26.....	5.00	600	3.30	585	2.41	710	1.91	900	2.95	4,130	3.32	5,656
27.....	4.60	600	3.00	595	2.91	660	1.85	790	2.90	3,930	3.29	5,528
28.....	4.65	620	2.70	600	3.04	640	1.89	862	2.80	3,540	3.22	5,234
29.....	4.65	680	.....	.....	2.90	655	1.85	790	2.75	3,350	3.35	5,785
30.....	5.02	760	.....	.....	2.40	670	1.90	880	2.55	2,625	3.30	5,370
31.....	4.60	760	.....	.....	2.40	690	.....	.....	2.53	2,555	.....	.....

^a Ice conditions Jan. 1 to April 14.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Kananaskis, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.	3.39	5,957	3.00	4,350	2.46	2,318	2.50	2,450	2.25	1,675	2.40	990
2.	3.80	7,800	2.98	4,250	2.45	2,285	2.52	2,520	2.23	1,621	2.71	960
3.	3.89	8,214	3.05	4,535	2.47	2,351	2.52	2,520	2.24	1,648	2.92	930
4.	4.04	8,904	3.12	4,822	2.45	2,285	2.50	2,450	2.21	1,567	3.00	900
5.	4.21	9,686	3.14	4,904	2.47	2,351	2.50	2,450	2.20	1,540	2.84	860
6.	4.28	10,008	3.10	4,740	2.45	2,285	2.46	2,318	2.20	1,540	3.02	810
7.	4.31	10,146	3.15	4,945	2.42	2,186	2.38	2,058	2.15	1,420	3.26	760
8.	4.01	8,766	3.11	4,781	2.44	2,252	2.43	2,219	2.16	1,444	3.45	720
9.	3.92	8,352	3.12	4,622	2.50	2,450	2.55	2,625	2.15	1,420	3.80	670
10.	3.89	8,214	2.90	3,930	2.35	1,965	2.50	2,450	2.20	1,540	3.29	620
11.	3.87	8,122	2.89	3,891	2.36	1,996	2.47	2,351	2.16	1,444	3.85	580
12.	3.90	8,260	2.79	3,502	2.43	2,219	2.44	2,252	2.14	1,396	3.75	550
13.	3.91	8,306	2.71	3,198	2.35	1,975	2.46	2,318	2.13	1,372	3.56	480
14.	3.94	8,444	2.76	3,388	2.38	2,058	2.40	2,120	2.00	1,080	3.64	430
15.	3.95	8,490	2.78	3,464	2.43	2,219	2.37	2,027	2.23	960a	3.57	420
16.	3.97	8,582	2.72	3,236	2.42	2,186	2.35	1,975	2.80	860	3.46	420
17.	3.72	7,132	2.74	3,312	2.40	2,120	2.40	2,120	3.64	865	3.38	450
18.	3.47	6,308	2.71	3,198	2.32	1,872	2.41	2,153	4.28	870	3.37	440
19.	3.41	6,044	2.68	3,088	2.31	1,841	2.42	2,186	3.63	880	3.26	450
20.	3.36	5,828	2.66	3,016	2.34	1,934	2.45	2,285	3.43	900	3.39	500
21.	3.48	6,352	2.62	2,872	2.32	1,872	2.40	2,120	2.81	920	3.38	580
22.	3.44	6,176	2.60	2,800	2.37	2,027	2.33	1,903	2.25	970	3.41	610
23.	3.29	5,528	2.66	3,016	2.38	2,058	2.33	1,903	2.10	1,020	3.33	630
24.	3.10	4,740	2.70	3,160	2.38	2,058	2.32	1,872	2.05	1,050	3.31	650
25.	3.03	4,453	2.69	3,124	2.37	2,027	2.40	2,120	2.10	1,090	3.30	660
26.	3.06	4,576	2.60	2,800	2.34	1,934	2.38	2,058	2.11	1,110	3.44	670
27.	3.05	4,535	2.58	2,730	2.35	1,975	2.34	1,934	2.02	1,110	3.42	670
28.	3.02	4,412	2.52	2,520	2.43	2,219	2.33	1,903	2.05	1,110	3.40	640
29.	3.04	4,494	2.50	2,450	2.47	2,351	2.31	1,841	2.09	1,080	3.40	610
30.	3.00	4,330	2.47	2,351	2.49	2,417	2.27	1,729	2.25	1,050	3.41	650
31.	2.97	4,210	2.49	2,417			2.27	1,720			3.64	700a

a Ice conditions Nov. 15 to Dec. 31.

MONTHLY DISCHARGE of Bow River near Kananaskis, for 1914.

(Drainage area 1,646 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.	1,290	600	859	0.521	0.60	52,818
February.	740	560	646	0.393	0.41	35,877
March.	740	605	670	0.407	0.47	41,197
April.	920	700	808	0.490	0.55	48,079
May.	4,130	1,168	2,583	1.570	1.81	158,820
June.	10,422	2,872	6,932	4.200	4.69	412,480
July.	10,146	4,210	6,957	4.230	4.88	427,770
August.	4,945	2,351	3,528	2.140	2.47	216,930
September.	2,450	1,841	2,136	1.300	1.45	127,100
October.	2,625	1,729	2,128	1.290	1.49	130,850
November.	1,675	860	1,218	0.740	0.83	72,480
December.	990	420	645	0.392	0.45	39,660
The year.					20.10	1,764,061

SESSIONAL PAPER No. 25c

KANANASKIS RIVER NEAR KANANASKIS.

Location.—On the SW. $\frac{1}{4}$ Sec. 34, Tp. 24, Rge. 8, W. 5th Mer., one and one-half miles above the junction with the Bow River.

Records available.—September 1, 1911, to November 11, 1911. January 1, 1912, to December 31, 1914.

Gauge.—Chain; elevation of zero maintained at 88.17 feet since April 20, 1912. Previous to April 20, 1912, gauge readings are at old station one and one-half miles downstream.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Gravel, very uniform.

Discharge measurements.—From cable and car.

Observer.—The Calgary Power Company.

DISCHARGE MEASUREMENTS of Kananaskis River near Kananaskis, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 7.....	H. C. Ritchie.....	100	117.0	1.11	6.14	206
Jan. 20.....	do.....	105	210.0	0.46	6.68	96
Feb. 16.....	do.....	36	73.1	2.18	9.46	159
Mar. 2.....	do.....	43	50.3	3.54	7.00	178
Mar. 16.....	do.....	97	177.0	0.80	4.72	144
April 1.....	do.....	97	132.0	1.05	4.67	139
April 13.....	do.....	100	186.0	0.93	4.76	172
April 30.....	do.....	104	209.0	1.15	5.02	231
May 11.....	do.....	114	244.0	2.02	5.55	492
May 26.....	do.....	120	333.3	3.44	6.26	1,147
June 8.....	do.....	123	381.7	4.33	6.09	1,666
June 22.....	do.....	120	417.0	4.68	6.62	1,951
July 8.....	do.....	125	432.0	4.82	6.70	2,086
July 20.....	do.....	123	392.0	4.03	6.42	1,580
Aug. 5.....	do.....	120	352.0	3.40	6.06	1,197
Aug. 17.....	do.....	121	329.0	3.06	5.89	1,008
Sept. 9.....	do.....	116	294.0	2.40	5.61	707
Sept. 21.....	do.....	116	286.0	2.22	5.56	635
Oct. 6.....	do.....	115	274.0	1.99	5.45	548
Oct. 20.....	do.....	115	282.0	2.12	5.55	598
Nov. 2.....	do.....	113	254.0	1.64	5.26	416
Nov. 30.....	do.....	107	224.0	1.16	5.00	260
Dec. 14.....	do.....	30	111.0	2.00	6.99	219

DAILY GAUGE HEIGHT AND DISCHARGE of Kananaskis River near Kananaskis, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	6.87	204 α	8.46	125	7.20	180	4.65	139	5.06	249	6.23	1,104
2.....	6.56	204	7.72	100	7.05	178	4.66	141	5.24	322	6.50	1,430
3.....	6.47	205	7.75	90	6.75	173	4.66	141	5.35	375	6.90	1,930
4.....	6.39	205	7.81	82	6.50	170	4.66	141	5.36	380	7.05	2,117
5.....	6.31	205	9.72	75	6.82	175	4.69	146	5.35	375	7.05	2,117
6.....	6.25	206	9.76	77	6.40	166	4.70	148	5.31	355	6.85	1,867
7.....	6.24	206	9.74	95	6.30	167	4.69	146	5.30	350	6.80	1,805
8.....	.....	202	9.81	130	6.35	169	4.69	146	5.32	360	6.69	1,673
9.....	6.16	195	10.20	155	6.16	165	4.68	144	5.42	412	6.23	1,130
10.....	6.19	180	10.10	155	6.14	165	4.70	148	5.53	480	6.17	1,090
11.....	5.72	145	10.00	153	6.15	165	4.75	158	5.54	486	6.17	1,110
12.....	5.73	143	10.10	150	6.14	165	4.74	156	5.54	486	6.28	1,250
13.....	6.10	158	10.15	151	6.10	164	4.75	158	5.60	525	6.38	1,400
14.....	6.15	162	9.99	153	5.78	163	4.74	156	5.67	577	6.50	1,570
15.....	6.18	160	9.74	157	5.01	150	4.76	160	5.97	830	6.60	1,720
16.....	5.95	140	9.27	159	4.65	144	4.80	169	5.97	830	6.70	1,880
17.....	5.76	125	9.10	161	4.63	142	4.78	164	6.12	982	6.78	2,160
18.....	5.44	115	9.00	164	4.62	140	4.79	167	6.15	1,015	6.95	2,260
19.....	6.36	105	8.84	160	4.62	140	4.84	179	6.16	1,026	7.00	2,370
20.....	6.70	96	8.44	160	4.66	140	4.82	174	6.16	1,026	6.75	2,070
21.....	8.54	94	8.75	170	4.65	142	4.83	177	6.01	870	6.65	1,960
22.....	8.35	88	8.10	162	4.66	142	4.84	179	6.02	880	6.65	2,000
23.....	9.34	83	8.20	167	4.70	143	4.89	192	6.01	870	6.45	1,720
24.....	.....	81	8.91	175	4.68	143	4.88	190	6.16	1,026	6.25	1,445
25.....	9.96	81	7.40	170	6.45	135	4.87	187	6.20	1,070	6.27	1,471
26.....	8.80	81	7.10	165	8.19	127	4.93	205	6.26	1,139	6.23	1,419
27.....	9.02	81	7.10	165	7.95	135	4.95	211	6.28	1,162	6.20	1,380
28.....	8.70	88	7.90	180	7.54	138	4.94	208	6.21	1,082	6.15	1,315
29.....	8.20	110	.....	.....	7.21	138	4.96	214	6.15	1,015	6.20	1,380
30.....	9.25	140	.....	.....	6.60	137	4.99	224	6.00	860	6.29	1,497
31.....	8.02	115	.....	.....	5.10	137 α	.....	.....	6.10	960	.....	.....

 α Ice conditions Jan. 1 to March 31.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Kananaskis River near Kananaskis, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	6.34	1,566	6.03	1,159	5.62	700	5.42	526	5.25	405	4.92	228
2.	6.47	1,748	6.01	1,133	5.63	710	5.41	518	5.25	405	5.03	275
3.	6.53	1,832	6.02 ^b	1,146	5.64	720	5.39	503	5.26	412	4.98	252
4.	6.60	1,930	6.03 ^b	1,159	5.64	720	5.40	510	5.23	391	4.98	252
5.	6.65	2,000	6.05	1,185	5.61	690	5.44	542	5.23	391	4.98	252
6.	6.71	2,084	6.02	1,146	5.60	680	5.44	542	5.21	377	4.97	248
7.	6.77	2,168	6.00	1,120	5.54	626	5.40	510	5.19	364	5.29	245 ^c
8.	6.73	2,112	6.03	1,159	5.55	635	5.39	503	5.17	352	6.04	241
9.	6.70	2,070	6.06	1,198	5.60	680	5.55	635	5.19	364	7.58	237
10.	6.66	2,014	6.01	1,133	5.52	608	5.48	574	5.16	346	7.71	232
11.	6.64	1,986	5.96	1,072	5.50	590	5.44	542	5.16	346	8.54	227
12.	6.60	1,930	5.93	1,036	5.51	599	5.40	510	5.15	340	8.51	224
13.	6.59	1,916	5.89	989	5.48	574	5.37	489	5.13	328	7.22	220
14.	6.63	1,972	5.86	956	5.42	526	5.52	608	5.08	300	6.99	218
15.	6.70	2,070	5.82	912	5.42	526	5.54	626	5.00 ^b	260	6.76	210
16.	6.68	2,042	5.80	890	5.40	510	5.60	680	5.00 ^b	260	6.58	195
17.	6.58	1,902	5.86	956	5.37	489	5.62	700	5.00 ^b	260	7.45	210
18.	6.49	1,776	5.88	978	5.37	489	5.61	690	5.00 ^b	260	6.98	200
19.	6.47	1,748	5.86	956	5.50	590	5.57	653	5.00 ^b	260	6.70	180
20.	6.38	1,622	5.82	912	5.49	582	5.57	653	4.98	252	6.77	175
21.	6.44	1,706	5.80	890	5.48	574	5.46	558	5.04	280	6.86	180
22.	6.37	1,608	5.70	780	5.52	608	5.45	550	5.04	280	6.94	185
23.	6.25	1,445	5.72	802	5.46	558	5.40	510	5.01	265	7.35	188
24.	6.16	1,328	5.76	846	5.45	550	5.46	558	5.01	265	6.90	180
25.	6.10	1,250	5.74	824	5.44	542	5.38	496	5.02	270	6.69	150
26.	6.08	1,224	5.70	780	5.46	558	5.33	461	5.01	265	6.48	125
27.	6.03	1,159	5.66	740	5.50	590	5.31	447	5.00	260	6.47	123
28.	6.01	1,133	5.62	700	5.51	599	5.30	440	5.00	260	6.44	121
29.	6.04	1,172	5.68	760	5.49	582	5.28	426	5.00	260	6.28	115
30.	6.01	1,133	5.66	740	5.46	558	5.28	426	4.98	252	6.04	110
31.	5.98	1,096	5.64	720	.....	.....	5.28	426	.....	.....	6.20	120 ^c

^b Gauge height interpolated.^c Ice conditions Dec. 7 to 31.

MONTHLY DISCHARGE of Kananaskis River near Kananaskis, for 1914.

(Drainage area 398 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January	206	81	142	0.356	0.41	8,731
February	180	75	143	0.360	0.37	7,942
March	127	153	153	0.384	0.44	9,408
April	224	139	169	0.425	0.47	10,056
May	1,139	249	722	1.810	2.09	44,394
June	2,370	1,090	1,653	4.150	4.63	98,360
July	2,168	1,096	1,701	4.280	4.93	104,590
August	1,198	700	961	2.420	2.79	59,090
September	720	489	599	1.500	1.67	35,643
October	700	426	542	1.360	1.57	33,326
November	412	252	311	0.780	0.87	18,506
December	275	110	197	0.495	0.57	12,113
The year	.....	.....	.....	.....	20.81	442,159

GHOST RIVER AT GILLIES' RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 23, Tp. 26, Rge. 6, W. 5th Mer., one mile above the junction with the Bow River.

Records available.—August 17, 1911, to November 11, 1911. January 1, 1912, to December 31, 1914.

Gauge.—Chain on left bank; 1911-13 elevation of zero, 91.15 feet; 1914 elevation of zero, 89.22 feet.

Bench-mark.—Stone on left bank; assumed elevation, 100.00 feet.

Channel.—Shifting gravel.

Discharge measurements.—Made by wading; at very high stages measurements made at highway bridge, one mile downstream.

Observer.—Miss E. Gillies.

DISCHARGE MEASUREMENTS of Ghost River at Gillies' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 9.....	H. C. Ritchie.....	41.0	59.6	2.34	3.68	139
Feb. 5.....	do.....	30.0	37.0	2.46	4.14	91
Mar. 5.....	do.....	35.0	32.5	3.88	3.50	126
Mar. 19.....	do.....	30.0	28.5	3.80	4.00	108
April 2.....	do.....	32.0	36.8	2.50	4.63	92
April 16.....	do.....	74.5	56.2	3.24	3.25	182
April 28.....	do.....	74.0	47.0	2.82	3.20	132
May 14.....	do.....	75.0	60.6	2.88	3.19	174
June 11.....	do.....	77.5	79.9	3.16	3.47	252
June 25.....	do.....	79.0	89.3	3.60	3.74	321
July 9.....	do.....	77.0	87.6	3.42	3.65	300
Aug. 6.....	do.....	76.0	76.4	3.14	3.50	240
Aug. 20.....	do.....	76.0	75.8	3.25	3.54	246
Sept. 10.....	do.....	75.5	67.7	2.84	3.42	192
Sept. 24.....	do.....	75.6	75.4	2.90	3.48	219
Oct. 8.....	do.....	76.0	78.7	3.08	3.50	243
Oct. 21.....	do.....	75.7	74.7	2.86	3.45	214
Nov. 5.....	do.....	75.6	70.8	2.73	3.37	194
Nov. 19.....	do.....	57.0	68.4	2.98	3.46	204
Dec. 3.....	do.....	56.0	70.6	2.02	3.47	142
Dec. 17.....	do.....	44.0	80.6	1.25	3.70	101

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Ghost River at Gillies' Ranch, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.92	167a	4.85	98	3.82	120	3.70	93	3.31	171	3.19	175
2.....	3.95	168	4.34	97	3.80	123	4.58	92	3.39	196	3.10	151
3.....	4.30	172	4.20	96	3.80	126	4.45	95	3.29	171	3.36	221
4.....	4.50	174	4.20	93	3.80	128	4.56	98	3.25	163	3.30	205
5.....	4.10	160	3.93	91	3.49	126	5.58	102	3.30	180	3.29	202
6.....	3.95	150	4.65	91	3.65	121	5.48	108	3.19	152	3.24	189
7.....	3.80	144	4.60	92	3.80	126	5.46	118	3.29	182	3.34	216
8.....	3.65	138	3.85	94	3.70	121	4.80	130	3.29	185	3.80	340
9.....	3.72	139	4.45	100	3.60	114	3.12	146a	3.32	196	3.43	240
10.....	3.72	139	4.10	104	3.34	110	3.11	143	3.37	208	3.44	243
11.....	3.63	134	3.82	102	3.80	115	3.11	143	3.35	210	3.47	251
12.....	3.60	132	4.10	110	4.00	118	3.15	154	3.36	215	3.50	259
13.....	3.65	134	4.05	108	4.19	116	3.20	168	3.30	202	3.83	348
14.....	3.65	134	3.98	107	4.25	113	3.30	196	3.22	183	3.56	275
15.....	3.56	128	4.10	122	4.25	111	3.36	212	3.32	210	3.69	310
16.....	3.49	124	4.08	120	4.90	110	3.25	182	3.22	183	3.68	308
17.....	3.50	125	4.08	118	4.01	110	3.20	165	3.15	163	3.70	313
18.....	3.52	126	4.05	114	3.96	108	3.20	162	3.15	163	3.76	329
19.....	3.50	125	3.95	110	3.94	108	3.21	161	3.10	151	3.76	329
20.....	3.47	124	3.92	106	3.75	110	3.19	153	3.15	163	3.79	337
21.....	3.49	120	3.90	105	3.80	109	3.19	150	3.10	151	3.50	259
22.....	3.55	115	3.95	104	3.76	114	3.19	147	3.15	163	3.47	251
23.....	3.52	112	3.95	110	3.94	116	3.21	148	3.15	163	3.42	237
24.....	3.49	104	3.95	115	3.62	112	3.22	148	3.25	192	3.41	235
25.....	4.35	96	4.00	118	3.55	109	3.19	138	3.15	163	3.74	324
26.....	5.05	95	4.00	116	4.87	106	3.20	138	3.05	138	3.56	275
27.....	5.06	94	3.84	124	4.03	103	3.20	135	3.05	138	3.73	321
28.....	5.05	94	3.82	120	5.76	101	3.25	146	3.00	124	3.70	313
29.....	5.00	97	.....	.....	4.05	99	3.25	150	2.96	113	3.65	300
30.....	5.00	103	.....	.....	4.12	97	3.30	166	2.96	113	3.60	286
31.....	4.85	101	.....	.....	5.75	95	.....	.....	3.09	148	.....	.....

a Ice conditions Jan. 1 to April 9.

DAILY GAUGE HEIGHT AND DISCHARGE of Ghost River at Gillies' Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	3.54	270	3.54	250	3.44	205	3.43	215	3.39	199	3.37	163
2.....	3.53	267	3.54	250	3.44	205	3.42	216	3.39	199	3.37	152
3.....	3.53	267	3.53	251	3.44	204	3.41	212	3.36	191	3.47	142
4.....	3.52	264	3.54	250	3.43	201	3.43	220	3.37	193	3.48	135
5.....	3.75	327	3.56	256	3.43	200	3.44	224	3.39	199	3.48	129
6.....	3.83	348	3.56	256	3.43	199	3.42	219	3.38	195	3.57	121
7.....	3.66	302	3.54	251	3.43	198	3.41	218	3.38	195	3.57	115
8.....	3.56	275	3.50	240	3.44	199	3.50	243	3.38	192	3.60	110
9.....	3.65	300	3.54	250	3.43	195	3.60	268	3.35	183	3.65	105
10.....	3.63	293	3.56	254	3.42	191	3.80	320	3.30	169	3.54	101
11.....	3.63	292	3.54	249	3.43	193	3.60	265	3.30	168	3.80	98
12.....	3.63	291	3.54	248	3.43	194	3.60	264	3.33	175	3.87	98
13.....	3.65	295	3.54	248	3.42	196	3.53	246	3.34	176	3.87	99
14.....	3.68	302	3.54	247	3.42	195	3.54	249	3.33	172	3.95	100
15.....	3.69	303	3.54	247	3.43	198	3.54	247	3.36	180	3.84	100
16.....	3.56	268	3.56	251	3.45	203	3.55	248	3.36	178	3.94	101
17.....	3.57	269	3.60	262	3.46	206	3.60	259	3.55	231	3.70	101
18.....	3.55	263	3.60	261	3.66	261	3.49	229	3.55	230	4.00	102
19.....	3.55	262	3.55	249	3.49	216	3.49	227	3.48	210	4.50	102
20.....	3.55	261	3.54	245	3.46	209	3.49	225	3.30	200	4.68	103
21.....	3.56	262	3.54	245	3.44	205	3.45	214	3.30	200	5.11	106
22.....	3.56	261	3.56	248	3.43	202	3.43	209	3.30	200	5.12	109
23.....	3.60	271	3.55	245	3.43	203	3.40	201	3.30	200	5.10	112
24.....	3.60	270	3.54	241	3.48	219	3.41	203	3.32	200 ^a	5.05	112
25.....	3.60	275	3.53	237	3.46	215	3.40	201	3.49	200	.....	112
26.....	3.58	270	3.53	236	3.46	216	3.41	203	3.49	200	5.04	110
27.....	3.55	261	3.49	225	3.45	215	3.40	201	3.46	200	5.00	111
28.....	3.55	260	3.47	218	3.44	214	3.40	201	3.46	200	5.02	112
29.....	3.54	257	3.47	217	3.44	215	3.40	201	3.39	196	5.00	114
30.....	3.54	257	3.47	216	3.43	214	3.39	199	3.38	180	4.85	114
31.....	3.54	256	3.43	204	.....	.....	3.39	199	.....	.....	4.75	112 ^a

^a Ice conditions Nov. 24 to Dec. 31.

MONTHLY DISCHARGE of Ghost River at Gillies' Ranch, for 1914.

(Drainage area 378 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	174	94	128	0.339	0.39	7,870
February.....	124	91	107	0.284	0.29	5,942
March.....	128	95	113	0.299	0.34	6,948
April.....	212	92	143	0.378	0.42	8,509
May.....	215	113	169	0.447	0.52	10,391
June.....	348	151	268	0.710	0.79	15,947
July.....	348	256	278	0.735	0.85	17,094
August.....	262	204	243	0.643	0.74	14,941
September.....	261	191	206	0.545	0.61	12,258
October.....	320	199	227	0.600	0.69	13,958
November.....	231	168	194	0.513	0.57	11,544
December.....	163	98	113	0.299	0.34	6,948
The year.....	.....	.....	.....	.....	6.55	125,402

SESSIONAL PAPER No. 25c

JUMPINGPOUND CREEK NEAR JUMPING POUND.

Location.—On the SE. $\frac{1}{4}$ Sec. 30, Tp. 24, Rge. 4, W. 5th Mer., at Jumping Pound post office.

Records available.—April 19, 1908, to October 31, 1914. Discharge measurements only, June, 1906.

Gauge.—Vertical staff, attached to bridge pile; elevation of zero has been maintained at 89.82 feet since establishment.

Bench-mark.—Permanent iron bench-mark on right bank; assumed elevation, 100.00 feet.

Channel.—Gravel and clay.

Discharge measurements.—At high water, made from highway bridge; at ordinary stages, by wading, downstream.

Winter flow.—No winter records have been obtained.

Observer.—John Bateman.

DISCHARGE MEASUREMENTS of Jumpingpound Creek near Jumping Pound, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 27.....	H. C. Ritchie.....	50.0	54.0	0.89	2.16	48.0
May 15.....	do.....	52.7	64.5	1.04	2.25	67.0
June 12.....	do.....	52.0	65.5	1.05	2.25	69.0
June 26.....	do.....	56.5	76.3	1.46	2.40	111.0
July 10.....	do.....	50.3	55.1	0.75	2.14	42.0
Aug. 7.....	do.....	27.5	30.9	0.39	1.91	12.0
Aug. 21.....	do.....	28.0	30.9	0.36	1.90	11.0
Sept. 11.....	do.....	20.0	26.8	0.35	1.84	9.4
Sept. 25.....	do.....	27.5	30.7	0.35	1.85	10.7
Oct. 9.....	do.....	31.0	36.6	0.73	2.04	27.0
Oct. 22.....	do.....	33.5	38.8	1.16	2.12	45.0

DAILY GAUGE HEIGHT AND DISCHARGE of Jumpingpound Creek, near Jumping Pound, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.12	39	2.14	42
2.....			2.12	39	2.14	42
3.....			2.15	44	2.15	44
4.....	2.90	345	2.15	44	2.19	53
5.....	3.00	410	2.16	46	2.25	67
6.....	3.06	456	2.14	42	2.40	111
7.....	2.92	358	2.14	42	2.40	111
8.....	2.79	282	2.14	42	2.35	96
9.....	2.75	261	2.13	40	2.35	96
10.....	2.75	261	2.19	53	2.36	99
11.....	2.74	256	2.20	55	2.25	67
12.....	2.65	212	2.20	55	2.35	96
13.....	2.55	168	2.20	55	2.36	99
14.....	2.30	80	2.20	55	2.40	111
15.....	2.25	67	2.20	55	2.35	96
16.....	2.24	65	2.25	67	2.30	80
17.....	2.20	55	2.25	67	2.29	78
18.....	2.18	51	2.25	67	2.29	78
19.....	2.16	46	2.26	70	2.26	70
20.....	2.16	46	2.26	70	2.21	57
21.....	2.14	42	2.25	67	2.17	48
22.....	2.12	39	2.27	73	2.15	44
23.....	2.20	55	2.29	78	2.14	42
24.....	2.19	53	2.28	75	2.14	42
25.....	2.18	51	2.27	72	2.18	51
26.....	2.17	48	2.26	70	2.20	55
27.....	2.15	44	2.25	67	2.22	60
28.....	2.14	42	2.24	65	2.26	70
29.....	2.14	42	2.22	60	2.20	55
30.....	2.13	40	2.20	55	2.18	51
31.....			2.16	46		

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DAILY GAUGE HEIGHT AND DISCHARGE of Jumpingpound Creek near Jumping Pound, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.15	44.0	1.93	14.4	1.88	11.0	1.82	8.6
2.....	2.14	42.0	1.92	13.6	1.87	10.5	1.81	8.3
3.....	2.16	46.0	1.91	12.8	1.85	9.5	1.84	9.2
4.....	2.18	51.0	1.90	12.0	1.86	10.0	1.86	10.0
5.....	2.20	55.0	1.89	11.5	1.86	10.0	1.90	12.0
6.....	2.20	55.0	1.96	17.0	1.85	9.5	1.94	15.2
7.....	2.40	111.0	1.99	20.0	1.85	9.5	1.95	16.0
8.....	2.28	75.0	1.99	20.0	1.87	10.5	1.95	16.0
9.....	2.27	73.0	2.00	21.0	1.86	10.0	2.04	26.0
10.....	2.27	73.0	2.08	32.0	1.85	9.5	2.02	22.0
11.....	2.25	67.0	2.10	35.0	1.84	9.2	2.01	22.0
12.....	2.20	55.0	2.06	29.0	1.87	10.5	2.00	21.0
13.....	2.22	60.0	2.05	27.0	1.90	12.0	1.98	19.0
14.....	2.19	53.0	2.01	22.0	1.95	16.0	1.95	16.0
15.....	2.13	40.0	2.00	21.0	1.98	19.0	2.00	21.0
16.....	2.08	32.0	2.00	21.0	1.98	19.0	2.07	30.0
17.....	2.08	32.0	1.98	19.0	1.95	16.0	2.15	44.0
18.....	2.06	29.0	2.01	22.0	1.95	16.0	2.00	21.0
19.....	2.05	27.0	2.00	21.0	1.94	15.2	2.25	67.0
20.....	2.04	26.0	1.99	20.0	1.94	15.2	2.26	70.0
21.....	2.03	25.0	2.00	21.0	1.92	13.6	2.12	39.0
22.....	2.02	23.0	2.00	21.0	1.90	12.0	2.14	42.0
23.....	2.00	21.0	1.91	12.8	1.88	11.0	2.11	37.0
24.....	1.99	20.0	1.92	13.6	1.86	10.0	2.09	33.0
25.....	1.95	16.0	1.92	13.6	1.85	9.5	2.08	32.0
26.....	1.98	19.0	1.93	13.4	1.85	9.5	2.07	30.0
27.....	1.96	17.0	1.93	14.4	1.84	9.2	2.06	29.0
28.....	1.95	16.0	1.92	13.6	1.83	8.9	2.05	27.0
29.....	1.95	16.0	1.91	12.8	1.83	8.9	2.02	23.0
30.....	1.94	15.2	1.90	12.0	1.82	8.6	2.00	21.0
31.....	1.93	14.4	1.89	11.5			1.98 ^a	19.0

^a Gauge height interpolated.

MONTHLY DISCHARGE of Jumpingpound Creek near Jumping Pound, for 1914.

(Drainage area 188 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (4 to 30).....	456.0	39.0	143.0	0.761	0.77	7,658
May.....	78.0	39.0	57.3	0.305	0.35	3,523
June.....	111.0	42.0	70.4	0.374	0.42	4,189
July.....	111.0	14.4	40.3	0.214	0.25	2,478
August.....	35.0	11.5	18.5	0.098	0.11	1,137
September.....	19.0	8.6	11.6	0.062	0.07	590
October.....	70.0	8.3	26.0	0.138	0.16	1,599
The period.....					2.13	21,274

BOW RIVER AT CALGARY

Location.—On N.E. $\frac{1}{4}$ Sec. 16, Tp. 21, Rg. 1, W. 5th Mer., at Langevin traffic bridge on North Street East, in the city of Calgary.

Records available.—May 8, 1908, to December 31, 1914, at this location since 1912.

Gauges.—(1) Standard chain type, on Langevin bridge, elevation of zero 82.59 feet during 1912-14. (2) Kinsley automatic, on Langevin bridge, elevation of zero 82.59 feet during 1914.

Bench mark.—Permanent iron benchmark near intersection of Second and Third avenues east, assumed elevation 100 (B.C.T.).

Channel.—Composed of coarse gravel; may shift in flood stages.

Discharge measurements.—Made from the downstream side of bridge.

Observer.—C. A. Long.

DISCHARGE MEASUREMENTS of Bow River at Calgary, in 1914.

Date.	Gauge.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. Ft.	Feet per sec.	Feet.	Sq.-ft.
Feb. 2	Highland Gauge	294	846	1.34	4.77	1,318
Feb. 9	J. S. Tinsley	282	763	1.40	4.18	1,019
Feb. 14	do	284	883	1.39	4.80	1,149
Feb. 24	do	286	904	0.94	5.00	853
Feb. 29	R. J. Tinsley	272	811	1.29	5.62	1,017
Feb. 34	J. S. Tinsley	271	747	1.39	5.36	974
Feb. 10	do	256	714	1.41	5.44	1,010
Feb. 27	do	276	712	1.25	5.24	892
Mar. 10	R. J. Tinsley	268	646	1.55	5.04	1,003
April 2	J. S. Tinsley	247	818	1.41	4.58	1,153
May 5	W. H. and K. H.	245	950	2.30	4.34 ^a	2,096
May 27	R. J. Tinsley	305	1,417	3.09	5.34 ^a	5,096
June 8	do	318	1,871	5.35	6.96 ^a	10,014
June 18	do	325	2,211	6.44	8.02 ^a	14,242
July 21	do	316	1,830	4.68	6.68 ^a	8,425
Aug. 12	do	301	1,574	5.43	5.43 ^a	4,716
Sept. 14	do	293	1,167	2.50	4.78 ^a	2,907
Oct. 19	do	294	1,194	2.01	4.83 ^a	3,118
Nov. 12	H. S. Kettle	280	943	2.02	4.19 ^a	1,910
Dec. 19	St. John and Rowley	254	773	1.24	4.01	958

^a Automatic gauge readings.

SESSIONAL PAPER No. 25.

DAILY GAUGE HEIGHTS AND DRAINAGE & DISCHARGE AT CANADIAN FALLS, 1901.

DAY	January				February				March				April			
	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge	Gauge Height	Discharge
1	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
2	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
3	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
4	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
5	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
6	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
7	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
8	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
9	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
10	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
11	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
12	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
13	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
14	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
15	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
16	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
17	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
18	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
19	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
20	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
21	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
22	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
23	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
24	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
25	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
26	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
27	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
28	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
29	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
30	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500
31	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500	5.66	1,500

- a Jan. 1 to April 7 and Dec. 1 to 15—continuous records.
 b April 30 to Dec. 5—automatically gauge records.
 c Gauge height interpolated.
 d Jan. 1 to April 30 and Dec. 7 to 31—no discharges.
 e April 6 to 9—discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Bow River at Calgary, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	6.93	9,720	5.72	5,560	5.11	3,775	4.81	3,025	4.30	2,050	3.98d	1,720
2.....	7.30	11,200	5.75	5,950	4.94	3,350	4.79	2,980	4.28	2,020	3.81	1,640
3.....	7.57	12,280	5.82	5,860	4.92	3,300	4.79c	2,980	4.29	2,035	3.78	1,540
4.....	7.82	13,390	5.82	5,860	4.90	3,250	4.78c	2,960	4.22	1,930	3.76	1,460
5.....	7.74c	13,030	5.87	6,010	4.86	3,150	4.78	2,960	4.04	1,690	3.74b	1,400
6.....	7.66c	12,670	5.81	5,830	4.90	3,250	4.76	2,920	3.98	1,630	3.72a	1,340
7.....	7.58c	12,320	5.81	5,830	4.86	3,150	4.71	2,820	3.90c	1,550	3.73	1,260
8.....	7.50c	12,000	5.81	5,830	4.84	3,100	4.87	3,175	3.82c	1,510	3.72	1,160
9.....	7.40	11,600	5.75	5,650	4.84	3,100	4.98	3,450	3.74	1,470	3.70	1,100
10.....	7.40	11,600	5.66	5,390	4.79	2,980	4.78	2,960	3.80	1,500	4.02	1,040
11.....	7.35	11,400	5.54	5,020	4.73	2,860	4.80	3,000	3.90	1,550	3.79	990
12.....	7.31	11,240	5.45	4,750	4.77	2,940	4.84	3,100	4.16	1,840	4.05	940
13.....	7.35	11,400	5.36	4,480	4.76	2,920	4.86	3,150	3.99	1,640	4.34	920
14.....	7.50	12,000	5.36	4,480	4.70	2,800	4.86	3,150	3.97	1,620	4.82	925
15.....	7.56	12,240	5.36	4,480	4.64	2,680	4.85	3,125	3.97	1,620	4.16	935
16.....	7.55	12,200	5.36	4,480	4.58	2,560	4.83	3,075	3.97	1,620	4.05	958
17.....	7.27	11,080	5.41	4,630	4.57	2,540	4.79	2,980	4.00	1,650	4.25	960
18.....	6.82	9,280	5.44	4,720	4.56	2,520	4.73	2,860	4.03c	1,680	4.28	970
19.....	6.58	8,430	5.38	4,540	4.55	2,500	4.70	2,800	4.07c	1,720	4.62	980
20.....	6.52	8,220	5.33	4,390	4.69	2,780	4.64	2,980	4.11c	1,765	4.56	990
21.....	6.67	8,745	5.26	4,180	4.76	2,920	4.57	2,540	4.15c	1,825	4.38	995
22.....	6.54	8,290	5.27	4,210	4.71	2,820	4.57	2,540	4.19c	1,855	4.62	1,000
23.....	6.26	7,310	5.33	4,390	4.64	2,680	4.54	2,480	4.22	1,930	4.75	1,000
24.....	6.07	6,645	5.32	4,360	4.59	2,580	4.51	2,420	4.27	2,005	4.97	1,005
25.....	5.96	6,280	5.23	4,090	4.57	2,540	4.51	2,420	4.38	2,170	5.06	1,010
26.....	5.89	6,070	5.15	3,875	4.60	2,600	4.48	2,360	4.23	1,945	4.99	1,020
27.....	5.83	5,890	5.10	3,750	4.67	2,740	4.50	2,400	4.18	1,870	5.01	1,025
28.....	5.79	5,770	5.10	3,750	4.78	2,960	4.41	2,220	4.14	1,810	5.06	1,030
29.....	5.74	5,620	5.10	3,750	4.90	3,250	4.40	2,200	4.10	1,750	5.19	1,035
30.....	5.73	5,590	5.09	3,725	4.88	3,200	4.34	2,110	4.08	1,730	5.00	1,040
31.....	5.70	5,500	5.10	3,750	.....	.....	4.33	2,095	.....	.....	4.99a	1,045

a Jan. 1 to April 7 and Dec. 6 to 31—observers' records.

b April 10 to Dec. 5—automatic gauge records.

c Gauge heights interpolated.

d Jan. 1 to April 10 and Dec. 1 to 31—ice conditions.

MONTHLY DISCHARGE of Bow River at Calgary, for 1914.

(Drainage area 3,113 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	1,560	800	1,054	0.339	0.39	64,808
February.....	1,055	845	945	0.304	0.32	52,483
March.....	1,144	908	1,034	0.332	0.38	63,578
April.....	1,870	1,150	1,498	0.481	0.54	89,140
May.....	5,470	1,660	3,700	1.190	1.37	227,500
June.....	14,290	4,990	10,208	3.280	3.66	607,380
July.....	13,390	5,500	9,645	3.100	3.57	593,050
August.....	6,010	3,725	4,750	1.530	1.76	292,070
September.....	3,775	2,500	2,926	0.940	1.05	174,110
October.....	3,450	2,095	2,772	0.890	1.03	170,444
November.....	2,170	1,470	1,767	0.568	0.63	105,143
December.....	1,720	920	1,111	0.357	0.41	68,312
The year.....	.....	.....	.....	.....	15.11	2,508,018

SESSIONAL PAPER No. 25c

ELBOW RIVER AT FULLERTON'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 12, Tp. 23, Rge. 5, W. 5th Mer., about 600 feet from Jake Fullerton's ranch, 35 miles southwest of Calgary.

Records available.—September 29, 1914, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 90.83 feet since establishment.

Bench-mark.—Tree-stump about 50 feet southeast of gauge; assumed elevation, 100.00 feet.

Channel.—Fairly permanent.

Discharge measurements.—Made by wading, about 800 feet downstream, from gauge.

Observer.—Jake Fullerton.

DISCHARGE MEASUREMENTS of Elbow River at Fullerton's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Sept. 11.....	H. S. Kerby.....	71.0	86.8	2.17	1.30	188
Sept. 29.....	do.....	71.0	96.4	2.39	1.43	230
Nov. 19.....	do.....	69.0	95.6	2.57	1.35	245
Dec. 29.....	R. J. McGuinness.....	100.0	89.0	1.39	2.75	123

DAILY GAUGE HEIGHT AND DISCHARGE of Elbow River at Fullerton's Ranch, for 1914.

DAY.	September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			1.43	232	1.50	275	1.35	230
2.....			1.43	233	1.49	272	1.36	215
3.....			1.44	236	1.49	272	1.36	197
4.....			1.45	240	1.48	272	1.37	176
5.....			1.45	242	1.47	269	1.40	157
6.....			1.45	243	1.47	271	1.50	135
7.....			1.46	245	1.46	267	1.65	120
8.....			1.47	246	1.47	270	1.69	105
9.....			1.47	248	1.46	270	1.68	97
10.....			1.47	250	1.45	266	1.70	90
11.....			1.47	252	1.45	268	1.70	85
12.....			1.48	254	1.44	266	2.30	85
13.....			1.48	256	1.44	266	2.35	86
14.....			1.49	258	1.44	267	2.90	88
15.....			1.49	260	1.35	243	3.80	90
16.....			2.00	404	1.33	238	3.80	93
17.....			2.02	410	1.35	244	3.55	96
18.....			2.02	412	1.34	243	3.42	98
19.....			1.82	354	1.31	234 ^c	3.32	102
20.....			1.64	304	1.30	245	3.32	104
21.....			1.60	294	1.30	245	3.32	106
22.....			1.58	290	1.30 ^a	245	3.27	108
23.....			1.57	287	1.30 ^a	245	3.17	112
24.....			1.55	283	1.30 ^a	245	3.07	114
25.....			1.55	283	1.30 ^a	245	3.07	115
26.....			1.54	282	1.30 ^a	245	3.07	117
27.....			1.54	283	1.30 ^a	245	3.07	120
28.....			1.54	284	1.30	245	3.07	122
29.....	1.43	230	1.53	281	1.30	243	2.62	123
30.....	1.43	232 ^c	1.53	282	1.35	240 ^b	2.57	126
31.....			1.53	284			2.53	128 ⁵

^a Gauge heights interpolated.

^b to ^b Ice conditions.

^c to ^c Shifting conditions.

MONTHLY DISCHARGE of Elbow River at Fullerton's Ranch, for 1914.

(Drainage area 254 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
September (29-30).....	232	230	231	0.909	0.068	916
October.....	412	232	281	1.110	1.280	17,278
November.....	275	234	255	1.000	1.120	15,174
December.....	290	85	121	0.476	0.550	7,440
The period.....					3.018	40,808

ELBOW RIVER AT CALGARY.

Location.—On SW. $\frac{1}{4}$ Sec. 14, Tp. 24, Rge. 1, W. 5th Mer.*Records available.*—May 8, 1908, to December 31, 1914.*Gauge.*—Standard chain on Twelfth ave. bridge; elevation of zero, 3,404.82 feet during 1912-14.*Bench-marks.*—(1) Permanent iron bench-mark near cable station; elevation, 3,423.85 feet above mean sea level (Geodetic Surveys of Canada). (2) Corner of wing wall of left abutment of traffic bridge; elevation, 3,420.07 feet above mean sea level (Geodetic Surveys of Canada).*Channel.*—Composed of gravel and boulders, liable to shift and affected by back water from the Bow River during flood stages of that stream.*Discharge measurements.*—Made from cable car, or in low stages by wading.*Winter flow.*—Open water conditions prevail at station.*Diversions.*—City of Calgary water supply intake twelve miles upstream from station.*Observer.*—Mrs. I. S. White.

DISCHARGE MEASUREMENTS of Elbow River at Calgary, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 8.....	J. S. Tempest.....	69.0	75.8	2.08	1.93	157
Jan. 15.....	do.....	65.0	65.8	1.94	1.87	128
Jan. 19.....	do.....	66.0	63.2	1.69	1.85	97
Jan. 24.....	do.....	63.0	52.0	1.45	1.68	75
Feb. 3.....	R. J. Srigley.....	120.0	204.0	0.50	1.90	101
Feb. 16.....	J. S. Tempest.....	58.4	65.0	1.94	1.86	126
Feb. 23.....	do.....	57.0	60.2	1.74	1.86	104
Mar. 9.....	R. J. Srigley.....	63.0	45.6	2.42	1.84	110
April 4.....	J. S. Tempest.....	72.0	77.6	2.48	1.93	192
May 9.....	R. J. Srigley.....	131.0	262.0	0.91	1.96	238
May 30.....	do.....	131.0	307.0	1.32	2.28	406
June 26.....	do.....	139.0	396.0	1.81	2.65	716
July 11.....	do.....	134.0	340.0	1.44	2.46	489
Aug. 13.....	do.....	129.0	277.0	0.89	1.93	248
Sept. 16.....	do.....	128.0	259.0	0.78	1.92	202
Oct. 22.....	do.....	136.0	323.0	1.22	2.25	395
Nov. 11.....	H. S. Kerby.....	128.0	260.0	0.84	2.02	219
Nov. 18.....	do.....	120.0	244.0	0.73	1.98	179
Dec. 12.....	R. J. McGuinness.....	123.0	196.0	0.52	1.88	102
Dec. 28.....	do.....	130.0	217.0	0.71	1.77	154

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Elbow River at Calgary, for 1911.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.73	104a	1.94	92	1.84	109	1.80	145	2.05	280	2.44	520
2.....	1.66	119	1.82	97	1.84	109	1.88	156	2.12	322	2.55	606
3.....	1.68	128	1.90	101	1.81	110	2.02	186	2.13	328	2.70	730
4.....	1.70	141	1.89	102	1.81	110	1.93	192b	2.15	340	2.84	822
5.....	1.72	156	1.88	100	1.81	110	2.06	260	2.08	300	2.74	752
6.....	1.89	159	1.87	98	1.84	110	2.19	334	2.05	284	2.65	684
7.....	1.88	159	1.90	98	1.84	110	2.10	280	2.01	232	2.80	794
8.....	1.87	157	2.06	100	1.84	110	2.02	240	1.97	232	2.56	624
9.....	1.84	155	1.82	103	1.84	110	2.07	266	1.96	238	2.47	558
10.....	1.72	153	1.75	108	1.79	111	1.96	210	2.14	338	2.44	540
11.....	1.95	148	1.82	112	1.83	112	2.14	310	2.15	344	2.39	504
12.....	1.65	148	1.82	116	1.84	113	2.22	360	2.10	314	2.38	498
13.....	1.66	144	1.82	119	1.88	114	2.24	372	2.09	308	2.52	602
14.....	1.82	136	1.88	122	1.89	115	2.16	326	2.19	370	2.81	812
15.....	1.83	128	1.88	125	2.14	115	2.06	270	2.19	370	2.82	822
16.....	1.82	121	1.89	126	2.06	115	2.16	326	2.18	362	2.90	878
17.....	1.84	114	1.90	127	2.05	115	2.14	318	2.36	484	2.99	944
18.....	2.03	106	1.86	127	1.84	114	2.05	266	2.36	484	3.11	1,020
19.....	1.86	97	1.84	125	1.82	114	1.97	224	2.49	576	3.09	1,014
20.....	1.70	94	1.84	119	1.78	113	2.10	298	2.46	556	3.01	962
21.....	1.70	93	1.90	110	1.76	112	1.92	200	2.41	514	2.77	796
22.....	1.66	87	2.06	105	1.86	112	1.89	190	2.37	486	2.60	674
23.....	1.68	80	1.86	104	1.82	111	1.96	224	2.35	468	2.50	604
24.....	1.68	75	1.86	104	1.76	111	1.96	224	2.32	446	2.37	412
25.....	1.68	75	1.98	105	1.74	111	2.02	258	2.40	500	2.51	614
26.....	1.70	76	1.81	106	1.61	112	2.09	302	2.46	542	2.67	730
27.....	1.70	78	1.80	107	1.61	113	1.96	230	2.47	546	2.53	624
28.....	1.69	80	1.81	108	1.61	115	1.89	196	2.32	440	2.45	560
29.....	1.66	81	.....	.....	1.61	119	1.94	222	2.30	422	2.39	510
30.....	1.63	82	.....	.....	1.70	122	2.01	258	2.28	408	2.41	520
31.....	1.64	85	.....	.....	1.84	130	.....	.....	2.32	436	.....	.....

a to b Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Elbow River at Calgary, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.44	532	1.98	254	1.85	186	1.97	236	2.00	234	1.91	125
2.....	2.47	548	1.97	250	1.85	186	1.97	236	1.95	208	1.91	124
3.....	2.47	542	1.97	254	1.86	190	2.02	262	1.93	196	1.87	123
4.....	2.48	544	1.96	250	1.84	178	2.06	284	1.93	194	1.83	117
5.....	2.67	678	1.95	248	1.89	200	2.10	306	1.93	192	1.80	112
6.....	2.84	796	1.93	238	1.87	192	2.11	316	1.94	194	1.79	109
7.....	2.70	686	1.96	256	1.85	180	2.06	284	1.94	192	1.78	110
8.....	2.58	594	1.89	222	1.90	200	2.01	256	1.94	190	1.78	110
9.....	2.51	538	1.97	264	1.85	180	2.10	306	1.94	188	1.78	100
10.....	2.47	502	2.21	414	1.85	176	2.19	364	1.97	198	1.82	100
11.....	2.46	490	2.05	314	1.85	176	2.15	338	2.01	214	1.86	101
12.....	2.42	464	1.98	274	1.84	172	2.13	324	1.99	202	1.87	102
13.....	2.43	476	1.93	248	1.84	168	2.08	296	1.95	182	1.77	104
14.....	2.50	528	1.94	250	1.85	172	2.04	272	1.92	166	1.62	106
15.....	2.51	542	1.95	256	1.87	182	2.21	372	1.90	156	1.56	106
16.....	2.52	554	1.91	234	1.91	198	2.22	378	1.86	138	1.55	104
17.....	2.43	492	2.15	370	1.86	178	2.24	390	1.94	166	1.55	108
18.....	2.32	418	2.06	314	1.86	178	2.26	402	1.89	179	1.54	112
19.....	2.25	374	2.09	330	1.86	178	2.30	430	1.98	172	1.52	110
20.....	2.17	328	2.01	280	1.90	198	2.35	464	2.02	179	1.61	114
21.....	2.21	356	1.92	232	1.94	216	2.36	472	2.12	170	1.70	120
22.....	2.26	392	1.85	200	1.97	232	2.32	442	2.01	162	1.75	125
23.....	2.18	346	1.94	240	1.94	218	2.26	398	1.96	154	1.81	130
24.....	2.14	326	1.95	244	1.96	228	2.24	386	1.97	151	1.86	136
25.....	2.11	310	1.95	244	1.96	228	2.21	364	1.98	149	1.93	142
26.....	2.10	306	1.95	240	1.96	228	2.19	352	1.96	146	1.96	149
27.....	2.10	308	1.91	220	1.98	240	2.17	336	1.94	142	2.01	158
28.....	2.06	290	1.89	210	1.97	236	2.14	318	1.92	138	1.89	153
29.....	2.03	274	1.84	184	1.97	236	2.07	276	1.92	134	1.76	149
30.....	1.99	256	1.83	180	1.97	236	2.12	302	1.91	130	1.78	144
31.....	1.98	252	1.84	184	.....	.....	2.06	268	.....	.....	1.80	143

MONTHLY DISCHARGE of Elbow River at Calgary, for 1914.

(Drainage area 474 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	159	75	115	0.242	0.27	7,071
February.....	127	92	110	0.231	0.24	6,109
March.....	130	109	113	0.238	0.27	6,948
April.....	372	145	255	0.538	0.60	15,174
May.....	576	232	396	0.836	0.96	24,349
June.....	1,020	412	691	1.438	1.63	41,117
July.....	706	232	453	0.956	1.10	27,854
August.....	414	180	255	0.538	0.62	15,679
September.....	240	168	199	0.420	0.47	11,841
October.....	472	236	336	0.709	0.81	20,660
November.....	234	130	174	0.367	0.41	10,354
December.....	158	100	121	0.255	0.29	7,440
The year.....	.....	.....	.....	.....	7.69	194,596

NOSE CREEK AT CALGARY.

Location.—On the NW. $\frac{1}{4}$ Sec. 13, Tp. 24, Rge. 1, W. 5th Mer., at the traffic bridge about one and one-half miles east of the centre of the city, and about one-quarter mile above the junction of Nose Creek with Bow River.

Records available.—April 24, 1911, to October 31, 1914.

Gauge.—Vertical staff; the elevation of zero of gauge maintained at 92.83 feet during 1911-12; 92.81 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made from the bridge or by wading.

Winter flow.—Observations discontinued through winter months.

Artificial control.—The regulation of the new C.P.R. dam in the Bow River about three-quarters of a mile downstream from station might affect this station.

Observer.—C. A. Lang.

DISCHARGE MEASUREMENTS of Nose Creek at Calgary, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April	J. S. Tempest	14.3	8.49	1.83	2.04	15.60
May 1.....	G. H. Whyte and H. S. Kerby	23.8	16.20	0.70	1.74	12.20
June 1.....	R. J. Strig'ey	19.6	11.70	0.59	1.64	6.92
June 27.....	do	23.4	14.24	1.69	1.84	24.12
July 22.....	do	21.5	8.20	0.86	1.66	7.02
Aug. 20.....	do	17.8	5.83	0.76	1.60	4.44
Sept. 14.....	do	19.1	6.72	0.86	1.63	5.77
Oct. 22.....	do	21.2	8.52	1.03	1.70	8.76

DAILY GAUGE HEIGHT AND DISCHARGE of Nose Creek at Calgary, for 1914.

DAY.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.66	7.0	1.72	10.9	1.58	4.1	1.55	3.4	1.63	5.7
2.....			1.66	7.0	1.67	7.6	1.58	4.1	1.55	3.4	1.63	5.7
3.....			1.66	7.0	1.66	7.0	1.58	4.1	1.55	3.4	1.63	5.7
4.....			1.65	6.4	1.64	6.0	1.56	3.6	1.55	3.4	1.66	7.0
5.....			1.66	7.0	1.66	7.0	1.54	3.2	1.55	3.4	1.70	9.3
6.....			1.70	9.3	1.78	16.7	1.50	2.6	1.55	3.4	1.76	14.4
7.....	1.71	10.1	1.70	9.3	1.74	12.5	1.58	4.1	1.55	3.4	1.77	15.5
8.....	1.71	10.1	1.71	10.1	1.71	10.1	1.60	4.6	1.67	7.6	1.77	15.5
9.....	1.71	10.1	1.71	10.1	1.66	7.0	1.63a	5.7	1.64	6.0	1.77	15.5
10.....	1.70	9.3	1.74	12.5	1.66	7.0	1.66	7.0	1.60	4.6	1.77	15.5
11.....	1.70	9.3	1.75	13.3	1.64	6.0	1.65	6.4	1.70	9.3	1.75	13.3
12.....	1.70	9.3	1.79	17.8	1.64	6.0	1.63	5.6	1.64	6.0	1.75	13.3
13.....	1.70	9.3	1.81	20.2	1.68	8.1	1.61	5.0	1.64	6.0	1.75	13.3
14.....	1.70	9.3	1.83	22.9	1.70	9.3	1.59	4.4	1.64	6.0	1.73	11.7
15.....	1.70	9.3	1.82	21.5	1.69	8.7	1.57	3.9	1.63	5.7	1.73	11.7
16.....	1.70	9.3	1.82	21.5	1.70	9.3	1.60	4.6	1.63	5.7	1.73	11.7
17.....	1.70	9.3	1.85	25.5	1.70	9.3	1.64	6.0	1.67	7.6	1.75	13.3
18.....	1.70	9.3	1.91	33.9	1.69	8.7	1.60	4.6	1.67	7.6	1.75	13.3
19.....	1.71	10.1	2.01	48.3	1.67	7.6	1.58	4.1	1.65	6.4	1.75	13.3
20.....	1.72	10.9	1.86	26.9	1.67	7.6	1.58	4.1	1.62	5.3	1.74	12.5
21.....	1.73	11.7	1.70	9.3	1.71	10.1	1.57	3.9	1.62	5.3	1.74	12.5
22.....	1.76	14.4	1.66	7.0	1.71	10.1	1.55	3.4	1.64	6.0	1.70	9.3
23.....	1.76	14.4	1.66	7.0	1.65	6.4	1.54	3.2	1.64	6.0	1.68	8.1
24.....	1.76	14.4	1.66	7.0	1.64	6.0	1.65	6.4	1.64	6.0	1.66	7.0
25.....	1.72	10.9	1.69	8.7	1.64	6.0	1.64	6.0	1.64	6.0	1.66	7.0
26.....	1.70	9.3	1.81	20.2	1.62	5.3	1.61	5.0	1.64	6.0	1.66	7.0
27.....	1.69	8.7	1.81	20.2	1.62	5.3	1.57	3.9	1.64a	6.0	1.66	7.0
28.....	1.69	8.7	1.78a	16.7	1.62	5.3	1.56	3.6	1.64	6.0	1.65	6.4
29.....	1.68	8.1	1.76	14.4	1.60	4.6	1.56	3.6	1.63	5.7	1.65	6.4
30.....	1.66	7.0	1.76	14.4	1.57	3.9	1.56	3.6	1.63	5.7	1.65	6.4
31.....	1.66	7.0			1.58	4.1	1.56	3.6			1.65	6.4

a Gauge height interpolated.

MONTHLY DISCHARGE of Nose Creek at Calgary, for 1914.

(Drainage area 319 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (7-31)	14.4	7.0	9.9	0.031	0.04	608
June.....	48.0	7.0	15.5	0.048	0.05	916
July.....	16.7	4.1	7.7	0.024	0.03	474
August.....	7.0	3.2	4.4	0.014	0.02	270
September.....	9.3	3.4	5.5	0.017	0.02	327
October.....	15.5	5.7	10.3	0.032	0.04	633
The period.....					0.20	3,228

CANADIAN PACIFIC RAILWAY COMPANY CANAL AT OGDEN.

Location.—On the NE. $\frac{1}{4}$ Sec. 21, Tp. 23, Rge. 29, W. 4th Mer., at bridge No. 3, six miles from headgates.

Records available.—May 1, 1911, to October 8, 1914. At bridge No. 2, two miles upstream, May 8, 1908, to October 9, 1910.

Gauge.—Vertical staff, in stilling box; also automatic two-day gauge.

Bench-mark.—Iron post on left bank on upstream side of traffic bridge; elevation, 13.35 feet above the zero of the gauge.

Discharge Measurements.—Made from bridge constructed by the Canadian Pacific Railway Company for this purpose.

Observer.—A. Hatcher, for the Canadian Pacific Railway Company.

Remarks.—Previous to July 1 and after September 21, daily gauge readings were not obtained at the regular station, and therefore records at the headgates were used for these periods. The computations have been made in co-operation with the Canadian Pacific Railway Company.

DISCHARGE MEASUREMENTS of Canadian Pacific Railway Company Canal at Headgates, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 10.....	C. L. Dodge (C.P.R.).....	70.1	148	2.30	2.51	342
June 19.....	do.....	74.0	234	3.10	4.06	727
June 20.....	R. J. Srigley.....	66.5	169	2.36	2.70	399
July 18.....	C. L. Dodge (C.P.R.).....				1.74	202

DISCHARGE MEASUREMENTS of Canadian Pacific Railway Company Canal at Ogden, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 7.....	C. H. Whyte and H. S. Kerby.....	50.0	93.7	0.81	1.33	78
May 20.....	R. J. Srigley.....	60.0	196.0	1.62	3.12	318
June 12.....	do.....	59.0	183.0	1.91	2.97	350
June 19.....	do.....	65.0	294.0	2.52	4.46	741
July 24.....	do.....	56.5	145.0	1.30	2.30	189
Aug. 21.....	do.....	61.0	217.0	1.65	3.45	357

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DAILY GAUGE HEIGHT AND DISCHARGE of Canadian Pacific Railway Company Canal at Ogden, for 1914.

DAY.	April.		May.		June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			0.60	50	2.10	266	3.15	311	3.17	315	3.23	325
2.....			0.80	74	2.10	266	3.20	320	3.18	317	3.19	318
3.....			0.90	86	4.10	738	3.20	320	3.18	317	3.20	320
4.....			0.90	86	4.35	812	3.25	325	3.19	318	3.23	325
5.....			0.90	86	3.50	582	3.31	339	3.24	327	3.22	323
6.....			1.90	230	2.85	421	3.35	346	3.40	355	3.24	327
7.....			0.90	86	2.85	421	3.40	355	3.65	400	3.40	355
8.....			0.90	86	4.45	829	2.95	279	3.68	405	3.65	400
9.....			1.40	150	3.85	673	2.69	241	3.67	404	3.75	418
10.....			1.85	222	2.90	434	2.64	234	3.65	400	3.70	409
11.....			1.90	230	2.44	332	3.45	364	3.68	405	3.55	382
12.....			2.00	248	2.42	328	3.45	364	3.55	382	3.56	384
13.....			1.80	214	2.45	334	3.47	368	3.51	375	3.59	389
14.....			1.50	166	2.55	355	3.40	355	3.53	378	3.52	377
15.....			1.50	166	2.45	334	3.40	355	3.50	373	3.50	373
16.....			1.50	166	2.55	355	2.35	193	3.48	369	3.37	350
17.....			1.50	166	2.62	370	2.32	190	3.47	368	3.45	364
18.....			1.50	166	2.60	366	2.29	186	3.45	364	4.30	528
19.....	1.00	98a	1.50	166	2.80	412	2.30	187	3.44	362	4.50	575
20.....	1.00	98	1.90	230	2.70	388	2.38	196	3.43	360	4.69	622
21.....	1.60	182	1.90	230	2.64	375	2.32	190	3.42	359	4.16	501
22.....	2.25	295	1.80	214	2.60	366	2.27	183	3.42	358	0.60	50a
23.....	2.25	295	1.80	214	2.40	324	2.25	180	3.46	366	0.60	50
24.....	1.80	214	1.80	214	4.00	710	2.25	180	3.45	364	0.60	50
25.....	1.00	98	1.90	230	3.50	582	2.23	178	3.40	355	0.60	50
26.....	0.70	62	1.90	230	3.00	458	2.23	178	3.40	355	0.60	50
27.....	1.90	230	1.90	230	3.15	494	2.32	190	3.40	355	0.60	50
28.....	0.60	50	1.90	230	3.15	494	3.44	362	3.40	355	0.60	50
29.....	0.60	50	2.30	304	3.10	482	3.20	320	3.30	337	0.60	50
30.....	0.60	50	2.30	304	2.80	412a	3.15	312	3.31	339	3.70	631a
31.....			2.30	304			3.16	313	3.32	341		

a Records from April 19 to June 30 and Sept. 22 to Sept. 30 were taken at the headgates.

MONTHLY DISCHARGE of Canadian Pacific Railway Company Canal at Ogden, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN OFF.
	Maximum.	Minimum.	Mean.	
April (19-30).....	295	50	143	3,403
May.....	304	50	186	11,437
June.....	829	266	457	27,193
July.....	368	178	271	16,663
August.....	405	315	361	22,197
September.....	631	50	313	18,625
The period.....				99,518

CANADIAN PACIFIC RAILWAY COMPANY CANALS, WESTERN SECTION, IRRIGATION BLOCK.

Main Canal A, which feeds the various secondary canals and distributaries of the Western Section, diverts water from the Bow River on the SE. $\frac{1}{4}$ Sec. 13, Tp. 24, Rge. 1, W. 5th Mer., at the city of Calgary.

The discharge measurements published herewith were made during investigations to determine absorption losses in the canals, conducted by this department in conjunction with the Canadian Pacific Railway Company, during 1913 and 1914.

DISCHARGE MEASUREMENTS of Secondary Canal A, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 18.....	NE. 3-24-28-4...	G. R. Elliott....	61.7	206.0	1.84	3.40	379 _a
1913 Sept. 22.....	NW. 2-24-28-4...	do	36.5	104.0	2.12	3.55	221
1914 June 5.....	do	R. J. McGuinness & G. H. Whyte	39.0	127.0	1.91	4.00	242
1914 Aug. 27.....	do	R. J. McGuinness.	38.1	105.0	1.89	3.32	199
1914 June 6.....	SE. 4-23-27-4...	R. J. McGuinness & G. H. Whyte	39.5	129.0	2.17	3.95	280
1914 Aug. 28.....	do	R. J. McGuinness	38.1	100.0	1.79	3.30	179
1913 Sept. 25.....	SW. 31-22-26-4...	G. R. Elliott....	34.5	100.0	2.21	3.30	221
1914 June 15.....	do	R. J. McGuinness	34.5	72.5	1.80	2.40	131
1914 Aug. 29.....	do	do	33.2	71.6	1.83	2.80	131
1914 June 15.....	SE. 21-22-26-4...	do	27.3	60.1	2.08	2.40	126
1914 Aug. 29.....	do	do	28.5	63.3	2.12	2.38	134
1914 June 15.....	NE. 35-22-26-4...	do	32.0	69.1	1.63	2.50	112
1914 Aug. 29.....	do	do	32.0	72.6	1.66	2.58	121
1913 Sept. 25.....	NE. 7-23-25-4...	G. R. Elliott....	22.5	60.6	1.77	2.00	154
1914 June 15.....	do	R. J. McGuinness	29.0	60.6	1.77	2.00	107
1914 Aug. 31.....	do	do	28.3	63.6	1.82	2.68	116
1914 Aug. 31.....	NW. 15-24-25-4...	do	29.3	61.4	1.76	2.50	108

a Measurement on Main Canal A.

DISCHARGE MEASUREMENTS of Distributaries from Secondary Canal A, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 Aug. 28.....	SW. 31-23-27-4...	R. J. McGuinness	3.5	4.07	0.54	.....	2.20
1913 Sept. 25.....	SE. 5-23-27-4...	G. R. Elliott....	14.0	12.80	1.00	1.20	12.80
1914 June 5.....	do	R. J. McGuinness & G. H. Whyte	10.7	4.55	0.77	0.67	3.50
1914 Aug. 28.....	do	R. J. McGuinness	6.0	2.29	0.90	0.60	2.20
1914 June 6.....	SW. 31-22-26-4...	R. J. McGuinness & G. H. Whyte	27.7	38.80	2.11	2.75	82.00 _a
1914 Aug. 29.....	do	R. J. McGuinness	26.0	24.00	2.42	2.18	58.00 _a
1914 Aug. 29.....	NW. 10-22-26-4...	do	3.5	1.95	1.51	.....	3.00
1913 Sept. 25.....	NE. 16-22-26-4...	G. R. Elliott....	6.5	6.21	1.05	0.72	6.50
1914 Aug. 29.....	do	R. J. McGuinness	.....	.....	.....	.....	0.40
1914 Aug. 29.....	NE. 26-22-26-4...	do	9.0	5.12	1.06	.....	5.40
1914 Aug. 31.....	NW. 7-23-25-4...	do .....	.....	.....	.....	.....	5.00
1914 Aug. 31.....	SW. 21-23-25-4...	do	5.9	1.86	2.69	0.23	6.42
1914 Aug. 31.....	SE. 33-23-25-4...	do	5.0	2.20	0.99	0.52	2.20
1914 Aug. 31.....	NE. 9-24-25-4...	do	3.6	1.08	0.92	0.30	0.99
1914 Aug. 31.....	NW. 15-24-25-4...	do	3.0	1.80	1.22	0.82	2.20

a Spillway.

DISCHARGE MEASUREMENTS of North Secondary Canal A, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 26.....	NE. 22-24-25-4...	G. R. Elliott....	15.4	12.90	1.70	1.55	22.0
1914 June 8.....	do	R. J. McGuinness	16.5	29.90	1.70	1.90	51.0
1914 Aug. 8.....	do	do	15.2	22.10	1.74	1.34	38.0
1914 June 4.....	NE. 26-24-25-4...	R. J. McGuinness & G. H. Whyte	12.5	15.50	1.55	1.70	24.0
1914 Aug. 8.....	do	R. J. McGuinness	12.3	18.80	1.86	1.80	35.0
1914 June 8.....	NW. 25-24-25-4...	do	12.7	13.50	1.71	1.30	23.0
1914 Aug. 8.....	do	do	12.4	12.60	1.54	1.01	19.4
1914 June 24.....	NE. 36-23-24-4...	do	7.0	6.40	1.41	0.80	9.0
1914 Aug. 10.....	do	do	8.0	6.72	1.55	0.80	10.4

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DISCHARGE MEASUREMENTS of Distributaries from North Secondary Canal A, in 1914.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 Aug. 10.....	NE. 29-24-24-4...	R.J. McGuinness.	3.2	2.16	1.35	.....	2.90
1914 Aug. 10.....	SE. 22-24-24-4...	do ..	2.3	1.21	1.50	.....	1.82
1914 Aug. 10.....	SE. 12-24-24-4...	do ..	2.0	0.24	0.58	.....	0.14

DISCHARGE MEASUREMENTS of South Secondary Canal A, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 26.....	SE. 22-24-25-4...	G. R. Elliott....	27.0	57.6	2.23	2.55	129.0
1914 June 8.....	do ..	R.J. McGuinness	26.0	51.4	1.81	2.40	93.0
1914 Aug. 20.....	do ..	do ..	25.5	45.2	1.68	2.04	76.0
1914 June 23.....	SW. 15-24-24-4...	do ..	25.5	55.4	1.89	2.40	105.0
1914 Aug. 20.....	do ..	do ..	26.3	47.6	1.51	2.30	72.0
1914 June 24.....	SW. 25-23-24-4...	do ..	25.0	44.8	1.96	2.10	88.0
1914 Aug. 21.....	do ..	do ..	23.7	42.4	1.70	1.75	72.0
1913 Sept. 26.....	SW. 2-23-23-4...	G. R. Elliott....	24.0	51.0	1.88	2.75	96.0
1914 June 7.....	do ..	R.J. McGuinness	24.0	56.4	1.86	3.10	105.0
1914 Aug. 22.....	do ..	do ..	21.5	42.8	1.50	2.61	64.0
1914 June 27.....	NE. 34-22-23-4...	do ..	21.7	48.1	1.64	2.30	79.0
1914 Aug. 26.....	do ..	do ..	20.0	34.1	1.44	1.60	49.0
1914 June 26.....	NW. 31-22-22-4...	do ..	11.0	9.5	1.27	1.00	12.0

DISCHARGE MEASUREMENTS of Gleichen Distributary B from South Secondary Canal A, in 1914

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 June 26.....	SW. 5-23-22-4...	R.J. McGuinness	13.3	18.00	1.64	1.80	30.0
1914 Aug. 24.....	do ..	do ..	12.7	14.60	1.38	1.50	20.0
1914 June 26.....	NW. 9-23-22-4...	do ..	3.0	2.80	2.54	1.20	7.1 ^a
1914 June 29.....	SE. 1-23-22-4...	do ..	12.2	12.40	1.22	1.40	15.2
1914 Aug. 24.....	do ..	do ..	12.0	13.80	1.40	1.49	19.4
1914 June 29.....	NE. 33-22-21-4...	do ..	8.0	6.80	1.44	0.90	9.8
1914 Aug. 24.....	do ..	do ..	9.3	12.00	1.44	1.29	17.3

^a Spillway.

DISCHARGE MEASUREMENTS of Gleichen Distributary C from South Secondary Canal A, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 26.....	NW. 31-22-22-4...	G. R. Elliott....	11.2	11.30	1.53	1.05	17.30
1914 Aug. 25.....	do ..	R.J. McGuinness	10.0	8.24	1.21	0.90	10.10
1914 June 29.....	SW. 25-22-22-4...	do ..	.....	.....	.....	0.40	1.06 ^a
1914 Aug. 25.....	do ..	do ..	.....	.....	.....	0.75	2.20 ^a
1914 June 29.....	SW. 25-22-22-4...	do ..	7.0	5.20	1.00	1.20	5.20
1914 Aug. 25.....	do ..	do ..	7.2	6.34	1.09	1.28	7.00

^a Spillway.

DISCHARGE MEASUREMENTS of Gleichen Distributary D from South Secondary Canal A, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 26	SE. 2-23-23-4...	G. R. Elliott....	9.8	10.80	1.68	1.60	18.10
1914 June 27	do	R. J. McGuinness	8.6	10.00	1.63	1.70	16.40
1914 Aug. 22	do	do	9.3	11.20	1.45	1.60	16.20
1914 June 26	SW. 14-23-23-4...	do	6.4	6.32	1.51	1.60	9.60
1914 June 29	WS. 14-23-23-4...	do	8.0	9.48	1.55	1.82	14.60
1914 Aug. 22	NE. 10-23-23-4...	do	3.6	1.69	0.35	.....	0.60 ^b
1914 Aug. 22	SE. 25-23-23-4...	do	10.9	8.46	1.63	0.68	13.80

^a Spillway.^b Lateral.

DISCHARGE MEASUREMENTS of Minor Distributaries from South Secondary Canal A, in 1913-14

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 Aug. 20	SE. 14-24-25-4...	R. J. McGuinness	.....	.....	.....	.....	0.33
1914 Aug. 20	NW. 7-24-24-4...	do .....	.....	.....	.....	.....	0.11
1914 Aug. 20	SW. 20-24-24-4...	do .....	.....	.....	.....	.....	0.06
1914 Aug. 21	SE. 4-24-24-4...	do .....	.....	.....	.....	.....	0.06
1914 Aug. 21	NE. 33-23-24-4...	do .....	.....	.....	.....	.....	0.06
1914 Aug. 21	NE. 33-23-24-4...	do .....	.....	.....	.....	.....	0.26
1914 Aug. 21	SW. 26-23-24-4...	do .....	.....	.....	.....	.....	0.17
1914 Aug. 21	NW. 24-23-24-4...	do .....	.....	.....	.....	.....	0.83
1914 Aug. 21	SE. 20-23-23-4...	do .....	.....	.....	.....	.....	0.36
1913 Sept. 26	NE. 34-22-23-4...	G. R. Elliott....	9.0	7.00	1.01	1.51	7.10 ^b
1914 June 27	do	R. J. McGuinness	8.1	5.25	1.03	1.40	5.40 ^b
1914 Aug. 22	NE. 10-23-23-4...	do	3.6	1.69	0.36	.....	0.60
1913 Sept. 26	SE. 2-23-23-4...	G. R. Elliott....	8.3	8.96	1.88	0.65	16.80 ^a
1914 June 26	SW. 7-23-22-4...	R. J. McGuinness	11.0	19.00	1.93	1.90	37.00 ^a
1914 Aug. 22	do	do	11.0	18.30	1.09	1.89	20.00 ^a

^a Mennonite spillway.^b Distributary E.

DISCHARGE MEASUREMENTS of North Secondary Canal B, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 June 5	SE. 36-24-28-4...	R. J. McGuinness & G. H. Whyte	36.5	58.4	1.66	1.81	97 ^a
1913 Sept. 15	SW. 7-25-26-4...	G. R. Elliott....	.....	.....	.....	3.72	260
1914 June 10	do	R. J. McGuinness	22.0	32.0	2.25	2.20	72
1914 Sept. 3	do	do	20.7	23.8	1.47	1.78	35
1914 June 5	NE. 6-25-25-4...	do	24.2	25.6	1.64	1.50	42
1914 Sept. 1	do	do	24.4	20.4	1.57	1.20	32
1913 Sept. 16	SE. 33-24-24-4...	G. R. Elliott....	33.8	97.1	2.56	3.80	248
1914 June 19	do	R. J. McGuinness	23.3	47.0	1.02	1.80	48
1914 Sept. 1	do	do	23.5	47.8	0.82	1.38	39

^a Measurement on Secondary Canal B above North and South branches.

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DISCHARGE MEASUREMENTS of Spillways, etc., from North Secondary Canal B, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 15.....	NW. 36-24-27-4..	G. R. Elliott....	13.0	36.10	2.16	0.98	78.00a
1914 June 10.....	do ..	R.J. McGuinness	7.3	2.02	0.46	0.65	0.92
1914 Sept. 2.....	do ..	do ..	8.1	3.43	0.55	0.89	1.90
1914 June 8.....	NE. 36-24-26-4..	do ..	4.3	1.69	0.84	0.40	1.42c
1914 June 30.....	NW. 1-25-23-4 ..	do ..	13.6	7.15	1.24	1.09	8.80
1914 June 30.....	do ..	do ..	16.6	19.80	1.88	1.90	37.00
1914 Sept. 1.....	do ..	do ..	11.5	5.71	0.94	0.86	5.50
1914 Sept. 1.....	SW. 1-25-25-4 ..	do ..	9.0	16.90	0.92	.....	15.60b

a Runs into North secondary B from South secondary B.

b Runs into North secondary B from North secondary A.

c South branch of Serviceberry Creek.

DISCHARGE MEASUREMENTS of Glenrose Distributary from North Secondary Canal B, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 16.....	SW. 3-25-24-4 ..	G. R. Elliott....	11.2	43.00	1.09	3.34	47.0
1914 June 19.....	do ..	R.J. McGuinness	14.3	27.10	0.74	2.40	20.0
1914 Aug. 13.....	do ..	do ..	16.9	29.80	0.77	2.52	23.0
1913 Sept. 17.....	SW. 18-25-23-4 ..	G. R. Elliott....	9.6	13.40	1.94	1.80	26.0
1914 June 19.....	do ..	R.J. McGuinness	8.4	6.36	1.24	0.75	7.6
1914 Aug. 13.....	do ..	do ..	10.3	12.40	1.53	1.51	19.9
1914 June 19.....	SE. 24-25-24-4 ..	do ..	8.7	7.81	0.96	1.60	7.5
1914 Aug. 13.....	do ..	do ..	9.7	10.80	1.15	1.90	12.4

DISCHARGE MEASUREMENTS of North Crowfoot Distributary from North Secondary Canal B, in 1914.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 June 19.....	NW. 34-24-24-4..	R.J. McGuinness	29.0	74.80	0.56	2.80	42.0a
1914 Aug. 12.....	do ..	do ..	15.7	13.40	1.13	0.88	15.1
1914 June 23.....	NW. 30-24-22-4..	do ..	10.5	15.40	1.96	1.40	30.0
1914 Aug. 12.....	do ..	do ..	5.6	5.30	2.40	0.90	13.4
1914 June 23.....	SW. 31-24-22-4 ..	do ..	7.9	11.00	1.93	1.60	21.0b
1914 Aug. 12.....	do ..	do ..	7.0	3.59	1.22	0.46	4.4b

a Measured above division of North and South Crowfoot.

b Spillway.

DISCHARGE MEASUREMENTS of South Crowfoot Distributary from North Secondary Canal B, in 1914.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 June 19.....	NW. 27-24-24-4..	R.J. McGuinness	16.0	14.40	1.25	1.10	19.0
1914 Aug. 11.....	do ..	do ..	10.5	10.40	1.68	0.92	17.5
1914 June 23.....	SE. 13-24-24-4 ..	do ..	7.0	5.20	0.79	0.80	4.4
1914 Aug. 11.....	do ..	do ..	9.0	11.10	1.76	1.48	19.6
1914 June 24.....	SE. 9-24-23-4 ..	do ..	6.7	2.65	0.69	0.70	2.0
1914 Aug. 11.....	do ..	do ..	8.3	8.44	1.26	1.48	10.6

DISCHARGE MEASUREMENTS of Laterals from Crowfoot Distributaries, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 June 19.....	NW. 27-24-24-4.	R.J. McGuinness	7.3	4.67	1.00	0.40	4.70
1914 Aug. 11.....	do	do					0.23
1914 Aug. 11.....	SE. 9-24-23-4.	do	5.8	3.81	1.29		4.92 ^a
1913 Sept. 17.....	NW. 30-24-22-4.	G. R. Elliott....	12.0	10.80	1.63	0.90	17.60
1914 June 23.....	do	R.J. McGuinness	5.2	4.12	2.29	0.80	9.40
1913 Sept. 17.....	SW. 16-24-22-4.	G. R. Elliott....	6.5	5.71	1.21		6.90
1913 Sept. 17.....	NW. 9-24-22-4.	do	8.0	3.54	0.68		2.40

^a Spillway.

DISCHARGE MEASUREMENTS of South Secondary Canal B, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec. ft.</i>
1913 Sept. 15.....	NW. 33-24-27-4.	G. R. Elliott....	20.6	41.10	2.48	2.18	102.00
1914 June 5.....	do	R.J. McGuinness					
		& G. H. Whyte	19.0	14.40	1.05	0.70	15.10
1914 Sept. 2.....	do	R.J. McGuinness	18.5	16.90	0.96	0.88	16.30
1913 Sept. 15.....	NW. 12-24-27-4.	G. R. Elliott....	12.0	20.90	2.06	2.40	43.20
1914 June 12.....	do	R.J. McGuinness	18.2	18.80	0.76	1.70	14.30
1914 Sept. 2.....	do	do	18.7	16.40	0.91	1.69	15.00
1914 June 12.....	SW. 29-24-26-4.	do	8.3	6.42	1.42	0.80	9.10
1913 Sept. 25.....	NE. 15-24-26-4.	G. R. Elliott....	8.6	8.19	1.45		11.90
1914 June 13.....	do	R.J. McGuinness	8.3	5.11	1.33	1.20	6.80
1914 Sept. 2.....	do	do	6.2	3.89	0.92	1.08	3.60
1914 June 13.....	SW. 23-24-26-4.	do	5.5	3.65	1.04	0.80	3.80
1914 Sept. 2.....	do	do	3.9	1.27	1.27	0.30	1.09

DISCHARGE MEASUREMENTS of Spillways from South Secondary Canal B, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 15.....	SW. 13-24-27-4.	G. R. Elliott....	14.5	21.60	2.64	2.10	57.00
1914 June 12.....	do	R.J. McGuinness	6.0	2.86	0.86	0.40	2.50
1914 Sept. 2.....	do	do	6.8	3.94	0.89	0.44	3.50
1913 Sept. 25.....	SW. 29-24-26-4.	G. R. Elliott....	2.8	3.72	2.63	1.25	9.80 ^a
1914 Sept. 2.....	do	R.J. McGuinness	2.8	1.26	1.04	0.69	1.31 ^a

^a Spill into North Secondary B Canal.

DISCHARGE MEASUREMENTS of Secondary Canal C, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 15.....	NE. 36-24-28-4.	G. R. Elliott....	37.0	34.3	1.20	1.36	41
1913 Sept. 19.....	do	do	43.5	112.0	2.46	3.06	276
1914 June 5.....	do	R.J. McGuinness					
		& G. H. Whyte	43.5	98.3	1.99	2.75	195
1914 Aug. 5.....	do	R.J. McGuinness	42.0	66.0	1.66	1.99	109

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DISCHARGE MEASUREMENTS of West Secondary Canal C, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913 Sept. 24.....	SW. 30-25-27-4	G. R. Elliott ...	19.4	32.80	2.01	2.10	66.0
1914 June 12.....	do	R.J. McGuinness	18.0	25.40	1.74	1.50	44.0
1914 Aug. 5.....	do	do	16.8	14.80	1.26	0.81	18.7
1913 Sept. 24.....	NW. 19-27-27-4	G. R. Elliott ...	6.9	21.60	2.82	3.18	61.0
1914 June 11.....	do	R.J. McGuinness	12.0	23.00	1.92	2.80	44.0
1914 Aug. 6.....	do	do	11.9	11.00	1.06	1.47	11.7
1914 Aug. 6.....	SW. 29-27-27-4	do	7.0	3.66	1.14	0.51	4.2

DISCHARGE MEASUREMENTS of Distributaries from West Secondary Canal C, in 1914.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 Aug. 5.....	SE. 30-25-27-4.	R.J. McGuinness	4.8	2.06	0.38	.....	0.78
1914 Aug. 6.....	NE. 5-26-27-4.	do	5.8	2.46	0.98	0.53	2.41
1914 Aug. 6.....	SE. 30-26-27-4.	do	4.4	2.22	0.37	.....	0.82
1914 Aug. 6.....	NE. 5-27-27-4.	do	5.0	7.30	0.27	.....	2.00
1914 June 11.....	SW. 29-27-27-4.	do	7.0	3.00	0.92	0.70	2.80

DISCHARGE MEASUREMENTS of East Secondary Canal C, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 Aug. 5.....	SW. 30-25-27-4.	R.J. McGuinness	26.6	26.0	2.20	.....	57.0
1913 Sept. 19.....	NW. 16-26-26-4.	G. R. Elliott ...	16.7	57.6	5.01	3.30	289.0
1914 June 10.....	do	R.J. McGuinness	38.7	40.8	1.41	0.80	58.0
1914 Sept. 3.....	do	do	38.5	43.7	1.49	0.87	65.0
1913 Sept. 19.....	SW. 27-26-26-4.	G. R. Elliott ...	31.1	103.0	2.35	3.70	242.0
1914 June 11.....	do	R.J. McGuinness	26.6	27.1	1.40	1.20	38.0
1914 Sept. 3.....	do	do	28.7	36.5	1.44	1.53	54.0
1913 Sept. 20.....	SE. 34-26-25-4.	G. R. Elliott ...	37.6	106.0	1.91	3.90	203.0
1914 June 16.....	do	R.J. McGuinness	27.5	35.8	1.05	2.00	38.0
1914 Sept. 4.....	do	do	25.0	34.6	1.07	1.36	37.0
1914 June 17.....	SW. 25-26-25-4.	R.J. McGuinness	22.3	28.0	0.90	1.60	25.0
1914 Sept. 5.....	do	do	22.6	28.4	1.16	1.81	33.0
1913 Sept. 20.....	NE. 18-26-24-4.	G. R. Elliott ...	31.3	105.0	1.89	4.10	198.0
1914 June 17.....	do	R.J. McGuinness	20.5	19.1	1.29	1.10	25.0
1914 Sept. 5.....	do	do	19.6	25.6	1.34	1.24	34.0
1913 Sept. 20.....	NE. 16-26-24-4.	G. R. Elliott ...	21.5	50.5	2.54	3.12	128.0
1914 June 18.....	do	R.J. McGuinness	15.1	16.6	1.36	1.40	22.0
1914 Sept. 5.....	do	do	15.6	19.8	1.55	1.60	31.0
1914 Sept. 7.....	do	do	15.0	16.6	1.47	1.41	24.0
1914 June 18.....	NW. 30-26-23-4.	do	8.0	8.5	2.18	1.50	18.6
1914 Sept. 7.....	do	do	14.2	16.6	1.27	1.31	21.0
1913 Sept. 23.....	SE. 31-26-23-4.	G. R. Elliott ...	12.0	14.4	1.88	1.49	27.0
1914 June 18.....	do	R.J. McGuinness	9.8	10.4	1.71	.....	17.9

DISCHARGE MEASUREMENTS of Distributaries from East Secondary Canal C, in 1913-14.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914 June 10.	NW. 30-25-26-4.	R. J. McGuinness	43.4	53.20	0.64	1.20	34.00 ^a
1914 Sept. 3.	do	do	12.5	4.38	0.20	0.20	0.87 ^a
1914 June 10.	NW. 22-26-26-4.	do	6.8	4.25	0.91	0.40	3.90
1913 Sept. 19.	SE. 28-26-26-4.	G. R. Elliott.	11.5	11.80	2.54	0.90	30.00
1914 Sept. 3.	NW. 27-26-26-4.	R. J. McGuinness	7.0	5.24	0.84	0.49	4.40
1914 Sept. 3.	SW. 27-26-26-4.	do	6.3	3.80	1.08	0.18	3.40
1914 Sept. 4.	SE. 35-26-26-4.	do	4.6	3.22	1.59	.....	5.10
1914 June 16.	NE. 34-26-25-4.	do	15.2	6.44	1.22	1.30	7.90 ^b
1914 Aug. 14.	do	do	12.0	5.23	0.78	1.19	4.10 ^b
1914 Sept. 4.	do	do	13.8	6.22	1.02	1.31	6.40 ^b
1914 Aug. 15.	SE. 1-27-25-4.	do	4.0	1.44	1.00	.....	1.45 ^b
1914 Aug. 15.	NW. 36-26-25-4.	do	.....	.....	.....	.....	0.08 ^b
1914 June 17.	SE. 33-26-24-4.	do	3.7	1.32	1.31	0.50	1.71 ^b
1914 Aug. 15.	do	do	2.5	0.55	0.53	0.10	0.29 ^b
1914 June 17.	NE. 23-26-25-4.	do	8.0	6.20	1.84	0.90	11.40
1914 Sept. 5.	do	do	8.1	5.07	0.98	0.66	5.00
1914 Sept. 5.	SW. 17-26-24-4.	do	4.0	1.30	0.88	.....	1.15

^a Spillway.^b Lateral F Swastika.

FISH CREEK NEAR PRIDDIS.

Location.—On SW. $\frac{1}{4}$ Sec. 26, Tp. 22, Rge. 3, W. 5th Mer., at the Percival ranch which is about one mile north of Priddis post office.

Records available.—May 13, 1907, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 91.24 feet during 1907-10; 90.81 feet during 1911-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Not liable to shift except in extreme high water.

Discharge measurements.—By wading, or from traffic bridge about one mile upstream.

Winter flow.—Observations discontinued during winter months.

Observer.—Fred Percival.

DISCHARGE MEASUREMENTS of Fish Creek near Priddis, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 8	J. S. Tempest	53	38.6	1.220	5.38	47.30
May 22	G. H. Whyte & H. S. Kerby	38	29.1	1.450	1.48	42.10
June 18	H. S. Kerby	35	29.5	0.953	1.31	28.10
July 8	do	38	41.6	1.110	1.52	46.30
Aug. 7	do	.....	.....	.....	0.55	1.05 ^a
Sept. 3	do	.....	.....	.....	0.60	1.93 ^a
Sept. 23	do	26	16.3	0.341	0.78	4.80
Oct. 21	do	34	26.4	0.760	1.25	20.10

^a Weir measurement.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Fish Creek near Priddis, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			6.20		1.20	20.0	1.10	15.2
2.....			6.21		1.20	20.0	1.11	15.7
3.....			6.22		1.20	20.0	1.11	15.7
4.....			6.10		1.35	31.0	1.11	15.7
5.....			6.13		1.35	31.0	1.13	16.6
6.....			6.15		1.34	30.0	1.16	18.1
7.....			5.99		1.34	30.0	1.40	35.0
8.....			5.15	47.0a	1.34	30.0	1.42	36.0
9.....			4.45	43.0	1.18	19.2	1.47	41.0
10.....			4.45	43.0	1.24	23.0	1.31	28.0
11.....			4.44	42.0	1.40	35.0	1.50	43.0
12.....			4.47	44.0	1.33	29.0	1.41	35.0
13.....			4.47	44.0	1.29	26.0	1.56	49.0
14.....			4.19	39.0	1.28	25.0	1.71	66.0
15.....	6.20	a	3.84	35.0	1.24	23.0	1.63	57.0
16.....	6.05		3.84	35.0	1.23	22.0	1.47	41.0
17.....	5.89		4.03	38.0	1.23	22.0	1.47	41.0
18.....	5.80		3.68	33.0	1.18	19.2	1.46	40.0
19.....	5.81		3.37	28.0	1.25	23.0	1.44	38.0
20.....	5.82		2.78	26.0	1.42	36.0	1.21	21.0
21.....	5.82		2.70	25.0a	1.62	55.0	1.12	16.2
22.....	5.82		1.26	24.0	1.59	52.0	1.11	15.7
23.....	5.82		1.35	31.0	1.43	37.0	1.10	15.2
24.....	5.80		1.34	30.0	1.49	42.0	1.10	15.2
25.....	5.80		1.44	38.0	1.32	28.0	1.19	19.7
26.....	5.81		1.44	38.0	1.31	28.0	2.01	110.0
27.....	5.80		1.44	38.0	1.20	20.0	1.91	94.0
28.....	5.81		1.44	38.0	1.29	26.0	1.75	71.0
29.....	5.82		1.23	22.0	1.16	18.1	1.55	48.0
30.....	5.79		1.22	21.0	1.13	16.6	1.45	39.0
31.....	5.80				1.10	15.2		

a Ice conditions March 15 to April 21—discharge estimated April 8 to 21. Not sufficient data to compute daily discharge from March 15 to April 8.

DAILY GAUGE HEIGHT AND DISCHARGE of Fish Creek near Priddis, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.34	30.0	0.63	1.7	0.61	1.6	0.72	2.5
2.....	1.23	22.0	0.63	1.7	0.60	1.5	0.73	2.6
3.....	1.23	22.0	0.54	1.2	0.60	1.5	0.73	2.6
4.....	1.23	22.0	0.57	1.3	0.60	1.5	0.74	2.8
5.....	1.29	26.0	0.63	1.7	0.60	1.5	0.98	9.9
6.....	1.30	27.0	0.62	1.6	0.60	1.5	0.99	10.2
7.....	1.82	81.0	0.66	1.9	0.59	1.4	1.05	12.8
8.....	1.59	52.0	0.54	1.2	0.70	2.1	1.06	13.3
9.....	1.56	49.0	0.54	1.2	0.72	2.5	1.14	17.1
10.....	1.52	45.0	1.20	20.2	0.72	2.5	1.14	17.1
11.....	1.18	19.2	1.09	14.7	0.66	1.9	1.25	23.0
12.....	1.10	15.2	1.10	15.2	0.66	1.9	1.25	23.0
13.....	1.03	11.9	0.90	7.2	0.86	5.9	1.25	23.0
14.....	1.06	13.3	0.90	7.2	0.86	5.9	1.24	23.0
15.....	1.05	12.8	0.76	3.2	0.85	5.6	1.28	26.0
16.....	1.03	11.9	0.75	3.0	0.85	5.6	1.28	26.0
17.....	0.98	9.9	0.94	8.5	0.85	5.6	1.31	28.0
18.....	0.92	7.8	0.98	9.9	0.85	5.6	1.38	33.0
19.....	0.87	6.2	0.97	9.5	0.85	5.6	1.27	25.0
20.....	0.87	6.2	0.86	5.9	0.84	5.3	1.26	24.0
21.....	0.89	6.9	0.85	5.6	0.84	5.3	1.26	24.0
22.....	0.93	8.2	0.85	5.6	0.84	5.3	1.24	23.0
23.....	0.88	6.6	0.85	5.6	0.84	5.3	1.24	23.0
24.....	0.86	5.9	0.84	5.3	0.77	3.5	1.10	15.2
25.....	0.78	3.7	0.77	3.5	0.77	3.5	1.10	15.2
26.....	0.78	2.7	0.75	3.0	0.77	3.5	1.10	15.2
27.....	0.73	2.6	0.75	3.0	0.77	3.5	1.10	15.2
28.....	0.68	2.0	0.70	2.1	0.77	3.5	1.10	15.2
29.....	0.68	2.0	0.68	2.0	0.68	2.0	1.03	11.9
30.....	0.68	2.0	0.68	2.0	0.68	2.0	1.04	12.4
31.....	0.63	1.7	0.68	2.0	.....	.....	1.04	12.4

MONTHLY DISCHARGE of Fish Creek near Priddis, for 1914.

(Drainage area 109 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (7-30) .	47.0	21.00	35.0	0.321	0.275	1,591
May.....	55.0	15.20	28.0	0.257	0.295	1,722
June.....	110.0	15.20	37.0	0.340	0.413	2,202
July.....	81.0	1.70	17.3	0.159	0.183	1,064
August.....	20.2	1.20	5.1	0.047	0.054	314
September.....	5.9	1.40	3.5	0.032	0.036	208
October.....	33.0	2.50	17.0	0.156	0.180	1,045
The period.....	.....	.....	.....	.....	1.436	8,146

SESSIONAL PAPER No. 25c

NORTH BRANCH OF SHEEP RIVER NEAR MILLARVILLE.

Location.—On SW. $\frac{1}{4}$ Sec. 12, Tp. 21, Rge. 3, W. 5th Mer., at Malcolm T. Miller's ranch, about one and one-half miles east of Millarville post office.

Records available.—May 22, 1908, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero of gauge 3,740.00 feet during 1908-10; 3,738.73 feet during 1911-14.

Bench-mark.—Permanent iron bench-mark; elevation 3,821.40 feet (Dominion Western Railway datum); located 36 feet southwest of the NE. corner of Sec. 2, Tp. 21, Rge. 3, W. 5th Mer., and about 300 feet west of the gauge.

Discharge measurements.—Made at the traffic bridge about one mile downstream on the road allowance on the east boundary of Sec. 12, or at a wading section, 200 feet downstream from the gauge.

Winter flow.—Observations not taken during winter months.

Diversions.—The headgates of Malcolm T. Miller's irrigation ditch are about 2 miles above station; to date this ditch has not been used.

Observer.—Malcolm T. Miller.

DISCHARGE MEASUREMENTS of North Branch of Sheep River near Millarville, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 7.....	J. S. Tempest.....	73	47.8	0.524	3.10	25.0
April 8.....	do.....	58	62.1	3.290	2.70	20.4
May 22.....	G. H. Whyte and H. S. Kerby	38	45.5	3.140	3.01	143.0
June 18.....	H. S. Kerby.....	34	33.6	2.721	2.78	91.0
July 7.....	do.....	35	32.4	2.564	2.74	83.0
Aug. 7.....	do.....	24	10.0	0.329	1.95	3.3
Sept. 3.....	do.....	19	11.0	0.412	2.00	4.5
Sept. 27.....	do.....	25	15.0	0.733	2.15	11.0
Sept. 20.....	do.....	35	35.8	2.308	2.85	90.0

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Sheep River near Millarville,
for 1914.

DAY.	April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.74	85	2.72	82	2.76	89.0
2.....			2.88	113	2.72	82	2.68	74.0
3.....			2.93	124	2.72	82	2.63	66.0
4.....			2.82	100	2.72	82	2.63	66.0
5.....			2.73	83	2.72	82	2.63	66.0
6.....			2.73	83	2.74	85	2.76	89.0
7.....			2.63	66	2.82	100	2.74	85.0
8.....	2.70	20 ^a	2.68	74	2.72	82	2.59	59.0
9.....	2.75	50	2.74	85	2.72	82	2.56	55.0
10.....	2.90	70 ^a	2.96	130	2.72	82	2.46	41.0
11.....	2.78	92	2.94	126	2.72	82	2.39	33.0
12.....	2.95	128	2.94	126	2.76	89	2.37	31.0
13.....	2.85	106	3.03	147	2.92	121	2.44	39.0
14.....	2.79	94	3.01	142	3.47	283	2.46	41.0
15.....	2.70	78	3.07	157	2.92	121	2.39	33.0
16.....	2.83	102	3.04	150	2.92	121	2.37	31.0
17.....	2.70	78	3.04	150	2.82	100	2.29	23.0
18.....	2.70	78	2.99	138	2.78	92	2.29	23.0
19.....	2.64	67	3.02	145	2.73	83	2.24	19.2
20.....	2.69	76	3.04	150	2.68	74	2.19	15.4
21.....	2.39	33	3.05	152	2.68	74	2.21	16.8
22.....	2.36	30	3.02	145	2.59	59	2.12	11.2
23.....	2.62	64	3.01	142	2.52	49	2.12	11.2
24.....	2.78	92	3.01	142	2.52	49	2.12	11.2
25.....	2.74	85	3.01	142	2.73	83	2.09	9.4
26.....	2.59	59	2.97	133	2.93	124	2.09	9.4
27.....	2.56	55	2.87	110	3.03	147	2.07	8.2
28.....	2.59	59	2.84	104	2.92	121	2.07	8.2
29.....	2.58	57	2.82	100	2.86	108	2.02	5.8
30.....	2.54	52	2.82	100	2.81	98	2.02	5.8
31.....			2.72	82			1.98	1.8

^a Ice conditions to April 11—discharge estimated.

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DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Sheep River near Millarville,
for 1914.

DAY.	August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Fect.</i>	<i>Sec.-ft.</i>	<i>Fect.</i>	<i>Sec.-ft.</i>	<i>Fect.</i>	<i>Sec.-ft.</i>
1.....	1.94	2.8	2.02	5.8	2.15	13.0
2.....	1.94	2.8	1.99	4.6	2.15	13.0
3.....	1.94	2.8	2.00	5.0	2.15	13.0
4.....	1.94	2.8	2.00	5.0	2.23	13.0
5.....	1.94	2.8	2.00	5.0	2.30	24.0
6.....	1.94	2.8	2.00	5.0	2.30	24.0
7.....	1.97	3.8	1.98	4.2	2.30	24.0
8.....	1.94	2.8	2.01	5.4	2.38	32.0
9.....	2.09	9.4	2.01	5.4	2.42	36.0
10.....	2.09	9.4	2.00	5.0	2.55	53.0
11.....	2.04	6.6	2.00	5.0	2.50	46.0
12.....	2.02	5.8	2.05	7.0	2.40	34.0
13.....	2.01	5.4	2.05	7.0	2.50	46.0
14.....	2.01	5.4	2.05	7.0	2.42	36.0
15.....	1.99	4.6	2.07	8.2	2.58	58.0
16.....	1.99	4.6	2.07	8.2	2.82	100.0
17.....	2.09	9.4	2.10	10.0	2.95	128.0
18.....	2.15	13.0	2.10	10.0	2.95	128.0
19.....	2.11	10.6	2.10	10.0	2.92	121.0
20.....	2.09	9.4	2.08	8.8	2.85	106.0
21.....	2.09	9.4	2.19	15.4	2.77	91.0
22.....	2.07	8.2	2.15	13.0	2.70	78.0
23.....	2.11	10.6	2.12	11.2	2.65	69.0
24.....	2.14	12.4	2.10	10.0	2.65	69.0
25.....	2.14	12.4	2.10	10.0	2.63	66.0
26.....	2.14	12.4	2.10	10.0	2.63	66.0
27.....	2.14	12.4	2.10	10.0	2.58	58.0
28.....	2.09	9.4	2.10	10.0	2.55	53.0
29.....	2.07	8.2	2.10	10.0	2.53	50.0
30.....	2.07	8.2	2.10	10.0	2.53	50.0
31.....	2.04	6.6			2.50	46.0

MONTHLY DISCHARGE of North Branch of Sheep River near Millarville, for 1914.

(Drainage area 199 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (8-30).....	128.0	20.0	71.0	0.357	0.30	3,238
May.....	157.0	66.0	120.0	0.603	0.69	7,378
June.....	283.0	49.0	97.0	0.487	0.54	5,772
July.....	89.0	1.8	35.0	0.176	0.20	2,152
August.....	13.0	2.8	7.3	0.037	0.04	449
September.....	15.4	4.2	8.0	0.040	0.04	492
October.....	128.0	13.0	56.0	0.281	0.31	3,443
The period.....					2.12	22,924

SOUTH BRANCH OF SHEEP RIVER NEAR BLACK DIAMOND.

Location.—On steel highway bridge on road allowance west of the SW. $\frac{1}{4}$ Sec. 17, Tp. 20, Rge. 2, W. 5th Mer., about one-half mile from Black Diamond post office.

Records available.—From May 23, 1908, to October 31, 1914.

Gauge.—Standard chain gauge; elevation of zero of gauge 93.66 feet, unchanged since established.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—Made from traffic bridge or by wading.

Winter flow.—No observations taken during winter months.

Observer.—H. A. Arnold.

DISCHARGE MEASUREMENTS of South Branch of Sheep River near Black Diamond, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 7.....	J. S. Tempest.....	28	27.4	2.26	0.82	62
May 21.....	G. H. Whyte and H. S. Kerby.....	79	126.0	2.51	1.41	317
June 17.....	H. S. Kerby.....	80	166.5	3.13	1.82	522
July 6.....	do.....	80	175.5	3.19	1.95	540
Aug. 6.....	do.....	73	72.3	1.24	0.81	90
Sept. 2.....	do.....	72	65.2	1.13	0.74	74
Sept. 22.....	do.....	74	82.5	1.48	0.96	123
Oct. 20.....	do.....	78	108.0	1.90	1.18	206

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Sheep River near Black Diamond, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.90	40	1.10	174	1.56	377
2.....			1.70	43	1.30	250	1.76	492
3.....			1.40	48	1.20	210	2.00	653
4.....			1.30	51	1.10	174	2.04	683
5.....			1.55	56	1.02	147	1.76	492
6.....			1.32	59	0.95	124	1.67	439
7.....			1.20	62	0.92	116	1.77	498
8.....			1.10	80 ^b	1.03	150	1.66	433
9.....			0.90	110	1.30	250	1.57	383
10.....			0.92	116	1.40	295	1.46	325
11.....			0.90	110	1.34	268	1.47	330
12.....			1.05	157	1.34	268	1.52	356
13.....			1.00	140	1.34	268	1.62	410
14.....			1.05	157	1.50	345	1.77	498
15.....	1.70	^b	1.05	157	1.75	486	1.82	529
16.....	1.70		1.10	174	1.70	456	1.84	542
17.....	1.70		1.05	157	1.55	372	1.84	542
18.....	1.70		1.00	140	1.55	372	1.86	555
19.....	1.70		0.90	110	1.65	427	1.75	486
20.....	1.70		1.00	140	1.55	372	1.64	421
21.....	1.70		0.80	85	1.52	356	1.48	335
22.....	1.70		0.80	85	1.55	372	1.36	277
23.....	1.70		0.95	124	1.62 ^a	410	1.34	268
24.....	1.68 ^a		1.10	174	1.68 ^a	444	1.17	197
25.....	1.65 ^a		1.00	140	1.72	468	1.45	320
26.....	1.62 ^a		0.85	97	1.65	427	1.43	310
27.....	1.60		0.90	110	1.52	356	1.57	383
28.....	1.60		0.84	95	1.47	330	1.49	340
29.....	1.42		0.85	97	1.41	300	1.42	305
30.....	1.60		1.00	140	1.56	377	1.30	250
31.....	1.50				1.33	263		

^a Gauge heights interpolated.

^b Ice conditions March 15 to April 8—discharge estimated. April 1 to 8—insufficient data to estimate discharge previous to April 1.

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DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Sheep River near Black Diamond, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.26	234	0.86	100	0.77	79	0.99a	137
2.....	1.26	234	0.86	100	0.75	75	1.00	140
3.....	1.22	218	0.83	92	0.74	73	0.97	130
4.....	1.20	210	0.80	85	0.74	73	1.10	174
5.....	1.28	242	0.80	85	0.71	67	1.00	140
6.....	1.70	456	0.83a	92	0.71	67	0.90	110
7.....	1.60	399	0.86a	100	0.71	67	0.92	116
8.....	1.50	345	0.89a	107	0.76	77	0.98	134
9.....	1.44	315	0.93a	118	0.71	67	1.02	147
10.....	1.35	272	0.96	127	0.69	63	1.02	147
11.....	1.31	254	0.88	105	0.72	69	1.01a	143
12.....	1.30	250	0.88	105	0.78	81	0.99a	137
13.....	1.30	250	0.83	92	0.77	79	0.98	134
14.....	1.30	250	0.80	85	0.77	79	1.05	157
15.....	1.27	238	0.78	81	0.80	85	1.15	192
16.....	1.20	210	0.87	102	0.82a	90	1.40	295
17.....	1.10	174	0.96	127	0.85	97	1.37	281
18.....	1.07	164	0.98	134	0.90	110	1.32	259
19.....	1.09	171	0.98	134	1.25	230	1.25	230
20.....	1.09	171	0.96	127	1.10	174	1.18	203
21.....	1.09	171	0.89	107	1.02	147	1.10	174
22.....	0.99	137	0.89	107	1.00	140	1.08	167
23.....	0.98	134	0.96	127	0.98	134	1.00	140
24.....	0.97	130	0.92	116	0.98	134	1.00	140
25.....	0.96	127	0.91	113	0.98	134	1.00	140
26.....	0.94	121	0.89	107	0.98	134	0.98	134
27.....	0.89	107	0.86	100	1.05	157	0.93	118
28.....	0.89	107	0.86	100	1.02	147	0.92	116
29.....	0.89	107	0.81	87	0.98	134	0.92	116
30.....	0.86a	100	0.81	87	0.99a	137	0.93	118
31.....	0.86a	100	0.79	83	.....	.....	0.91	113

a Gauge heights interpolated.

MONTHLY DISCHARGE of South Branch of Sheep River near Black Diamond, for 1914.

(Drainage area 248 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	174	40	108	0.436	0.49	6,426
May.....	486	116	310	1.250	1.44	19,061
June.....	683	197	414	1.670	1.86	24,635
July.....	456	100	206	0.831	0.96	12,666
August.....	134	81	104	0.420	0.48	6,395
September.....	230	63	107	0.432	0.48	6,367
October.....	295	110	157	0.633	0.73	9,634
The period.....	.....	.....	.....	.....	6.44	85,204

SHEEP RIVER NEAR OKOTOKS.

Location.—On the NW. $\frac{1}{4}$ Sec. 22, Tp. 20, Rge. 29, W. 4th Mer., at the Canadian Pacific Railway Company's bridge about one mile southeast of Okotoks.

Records available.—From May 7, 1909, to October 31, 1914.

Gauge.—Staff. High water staff gauge is imbedded in the cement on centre pier. The elevation of the zero of the gauge was maintained at 3,420.09 feet during 1909-10; 3,418.12 feet during 1911; 3,417.12 feet during 1912-14.

Bench-mark.—Top of the left abutment at southwest corner; elevation, 3,431.57 feet above mean sea level (C.P.R. datum).

Channel.—Shifting.

Discharge measurements.—From bridge or by wading.

Winter flow.—Observations discontinued during winter months.

Artificial control.—Gas pipes crossing river below gauging section form good control.

Observer.—Miss M. B. Henderson.

DISCHARGE MEASUREMENTS of Sheep River near Okotoks, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 9.....	J. S. Tempest.....	51	57.6	2.69	2.40	156
May 20.....	H. S. Kerby.....	98	369.0	1.89	3.09	696
June 16.....	do.....	98	378.8	1.85	3.34	699
July 10.....	do.....	143	264.0	1.42	2.75	374
Aug. 10.....	do.....	85	135.0	1.04	2.42	140
Sept. 1.....	do.....	86	129.0	0.78	2.28	100
Sept. 21.....	do.....	87	131.0	1.20	2.52	157
Oct. 17.....	do.....	97	342.0	1.02	2.90	351

DAILY GAUGE HEIGHT AND DISCHARGE of Sheep River near Okotoks, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.63 ^a	276	2.87	382
2.....			2.78	397	3.11	602
3.....			2.83	442	3.32	804
4.....	2.54	217	2.68	313	3.37	854
5.....	3.04	646	2.58 ^a	242	3.17	636
6.....	2.93	537	2.49	187	3.17	628
7.....	2.71	337	2.48	182	3.37	820
8.....	2.53	211	2.53	211	3.11	550
9.....	2.53	217	2.68	313	3.01	446
10.....	2.60	254	2.88	489	2.93	362
11.....	2.49	187	2.87	479	2.93	354
12.....	2.53	211	2.90 ^a	508	3.01	430
13.....	2.62	269	2.93	537	3.08	492
14.....	2.53	211	2.98	586	3.27	646
15.....	2.53	211	3.18	789	3.35	710
16.....	2.58	242	3.18	789	3.32	682
17.....	2.49 ^a	187	3.18	789	3.25	620
18.....	2.45	167	3.18	789	3.20	584
19.....	2.44	162	3.18	789	3.16	556
20.....	2.47	177	3.09	696	3.06	470
21.....	2.38	135	3.09	692	2.96	390
22.....	2.38	135	3.06	652	2.92	360
23.....	2.37	131	3.05	632	2.77	252
24.....	2.61	261	3.08	652	2.76	252
25.....	2.53	211	3.08 ^a	650	3.06	502
26.....	2.48	182	3.07	624	3.37	838
27.....	2.48	182	3.07	610	3.28	756
28.....	2.43	157	2.92	460	3.28	768
29.....	2.42	152	2.82	360	3.11	606
30.....	2.48	182	2.89 ^a	414	3.04	552
31.....			2.95	464		

^a Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Sheep River near Okotoks, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.90	512	2.33	117	2.28	100	2.45	135
2.....	2.98	512	2.32	114	2.25	92	2.45 _a	135
3.....	2.97	514	2.31	110	2.25	92	2.45	135
4.....	2.95	500	2.30	106	2.24	88	2.48 _a	145
5.....	3.05	608	2.29	103	2.23	84	2.50	152
6.....	3.20	772	2.29	103	2.23	82	2.47	141
7.....	3.07 _a	648	2.31	110	2.24	84	2.47 _a	141
8.....	2.95	540	2.30	106	2.26	86	2.47	141
9.....	2.86	464	2.37 _a	131	2.24	82	2.58	182
10.....	2.81	424	2.45	167	2.23	80	2.60	190
11.....	2.79	405	2.36	128	2.24	80	2.55	171
12.....	2.78 _a	397	2.35	124	2.30	92	2.53 _a	163
13.....	2.77	388	2.35	124	2.25	80	2.50	152
14.....	2.76	380	2.31	110	2.25	78	2.50	152
15.....	2.73	353	2.33	117	2.30 _a	88	2.65	212
16.....	2.65	291	2.35	124	2.32 _a	90	2.84	311
17.....	2.61	261	2.40	142	2.35	98	2.95	385
18.....	2.54	217	2.45	167	2.33	92	3.03	443
19.....	2.54	217	2.44	162	2.42 _a	116	3.05	458
20.....	2.53	211	2.40	142	2.55	172	2.85	319
21.....	2.52	204	2.37	131	2.50	152	2.82 _a	300
22.....	2.48	182	2.41 _a	147	2.45	135	2.80	288
23.....	2.40	172	2.45	167	2.44 _a	132	2.80	288
24.....	2.44	162	2.41	147	2.43	129	2.65	212
25.....	2.41	147	2.40	142	2.44 _a	132	2.63 _a	203
26.....	2.40	142	2.37	131	2.45	135	2.60	190
27.....	2.35	124	2.36 _a	128	2.47	141	2.55	171
28.....	2.35	124	2.35	124	2.45	135	2.55	171
29.....	2.35	124	2.33 _a	117	2.45 _a	135	2.55	171
30.....	2.35	124	2.30	106	2.45	135	2.51	156
31.....	2.34	120	2.30	106	.....	.....	2.49	149

_a Gauge height interpolated.

MONTHLY DISCHARGE of Sheep River near Okotoks, for 1914

(Drainage area 632 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (4-30).....	646	131	228	0.361	0.36	12,188
May.....	789	182	517	0.818	0.94	31,789
June.....	854	252	563	0.890	0.99	33,501
July.....	772	120	330	0.522	0.60	20,200
August.....	167	103	128	0.203	0.23	7,870
September.....	172	78	108	0.171	0.19	6,426
October.....	458	135	212	0.335	0.39	13,035
The period.....	.....	.....	.....	.....	3.70	125,099

HIGHWOOD RIVER AT BROWN'S RANCH.

Location.—On SE. $\frac{1}{4}$ Sec. 20, Tp. 18, Rge. 2, W. 5th Mer., at B. F. Brown's ranch, about eight miles north of Pekisko and five miles west of Longview post office.

Records available.—July 27, 1912, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero of gauge maintained at 93.90 feet during 1912; 91.97 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Shifts during floods.

Discharge measurements.—Made from the traffic bridge one and one-half miles downstream, or by wading near bridge.

Winter flow.—Observations discontinued during winter months.

Observer.—B. F. Brown.

DISCHARGE MEASUREMENTS of Highwood River at Brown's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 12.....	J. S. Tempest.....	128	103.0	2.64	1.40	271
May 27.....	H. S. Kerby.....	178	340.0	3.29	1.65	1,118
June 22.....	do.....	159	286.0	3.15	2.05	910 ^a
July 19.....	do.....	158	171.0	2.53	1.18	434
Aug. 17.....	do.....	120	93.5	2.05	0.77	188
Sept. 5.....	do.....	119	77.5	1.85	0.62	144
Sept. 24.....	do.....	120	95.5	2.00	0.75	191
Oct. 24.....	do.....	120	117.0	2.33	0.95	272

^a Measurement affected by a log jam.

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at Brown's Ranch, for 1914.

Day.	April.		May.		June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			1.00	310	2.02	1,850	1.85 ^c	1,510
2.....			1.25	510	2.32	2,450	2.05	1,910
3.....			1.40	690	2.42	2,650	1.95	1,110
4.....			1.35	625	2.37	2,550	1.80	1,410
5.....			1.15	420	2.27	2,350	1.75	1,310
6.....			1.05	345	2.17	2,150	1.65	1,115
7.....			1.00	310	2.15	2,110	1.45	760
8.....			1.15	420	2.00	1,810	1.40	690
9.....			1.33	601	1.85	1,510	1.38	664
10.....			1.35	625	1.80	1,410	1.35	625
11.....			1.20	465	1.85	1,510	1.30	565
12.....	1.40	271 ^a	1.22	478	1.90	1,610	1.30	565
13.....	1.00	230	1.35	625	1.92	1,650	1.28	543
14.....	1.05	220	1.50	840	2.47 ^b	1,310	1.25	510
15.....	0.80	195 ^a	1.70	1,210	2.52	1,410	1.25	510
16.....	0.75	180	1.70	1,210	2.75	1,510	1.20	465
17.....	0.73	174	1.68	1,172	2.95	1,610	1.02	324
18.....	0.70	165	1.70	1,210	3.00	1,610	1.15	420
19.....	0.65	150	1.74	1,290	2.65	1,210	1.15 ^c	420
20.....	0.75	180	1.75	1,310	2.22	1,020	1.15	420
21.....	0.60	140	1.73	1,270	2.28	1,020	1.14	412
22.....	0.60	140	1.70	1,210	2.05	930	1.10	380
23.....	0.75	180	1.70	1,210	1.93	930	1.05	345
24.....	0.70	165	1.73	1,270	2.00	1,020	1.00	310
25.....	0.80	200	1.85	1,510	2.25	1,210	1.00	310
26.....	0.80	200	1.80	1,410	2.40	1,410	0.95	280
27.....	0.75	180	1.75	1,310	2.55 ^b	1,610	0.95	280
28.....	0.75	180	1.60	1,020	2.00	1,810	0.92	262
29.....	0.80	200	1.47	792	2.05	1,910	0.90	250
30.....	0.85	225	1.42	718	2.00	1,810	0.88	240
31.....			1.67	1,153			0.85	225

^a Ice conditions April 12 to 15—discharge estimated.

^b Log jam June 14 to 27—discharge estimated.

^c Logs took gauge out July 1—gauge height estimated by observer.

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DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at Brown's Ranch, for 1914.

—Concluded.

Day.	August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Second.	Feet.	Second.	Feet.	Second.
1	0 85	225	0 85	180	0 75	190
2	0 84	220	0 85	180	0 80	200
3	0 82	210	0 85	180	0 85	235
4	0 85	225	0 64	148	0 88	230
5	0 85	225	0 65	150	0 90	250
6	0 85	225	0 65	150	0 86	200
7	0 85	225	0 63	146	0 85	225
8	0 85	225	0 65	150	0 85	225
9	0 86	230	0 65	150	0 87	235
10	0 85	225	0 65	150	0 90	250
11	0 85	225	0 67	156	0 87	235
12	0 80	200	0 68	159	0 85	225
13	0 79	196	0 70	165	0 85	225
14	0 75	180	0 68	159	0 85	225
15	0 75	180	0 65	150	0 87	235
16	0 76	184	0 66	153	0 90	250
17	0 75	180	0 70	165	1 15	420
18	0 75	180	0 75	180	1 20	465
19	0 80	200	0 80	200	1 15	420
20	0 77	188	0 85	225	1 15	420
21	0 75	180	0 85	225	1 14	412
22	0 75	180	0 83	215	1 10	380
23	0 75	180	0 80	200	0 98	298
24	0 76	184	0 75	180	0 95	280
25	0 75	180	0 74	177	0 94	274
26	0 73	174	0 73	174	0 90	250
27	0 73	174	0 80	200	0 90	250
28	0 75	180	0 80	200	0 88	240
29	0 72	171	0 80	200	0 87	235
30	0 70	165	0 77	188	0 87	235
31	0 67	156			0 85	225

MONTHLY DISCHARGE of Highwood River at Brown's Ranch, for 1914.

¹Drainage area 421 square miles.

MONTH.	DISCHARGE IN SECOND FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (12-30)	271	140	188	0 446	0 325	7,093
May	1,510	310	888	2 110	2 433	54,601
June	2,650	930	1,632	3 880	4 329	97,110
July	1,910	225	617	1 466	1 690	37,938
August	230	156	196	0 466	0 537	12,052
September	225	146	172	0 409	0 456	10,235
October	465	180	273	0 648	0 747	16,786
The period.					10 517	235,815

PEKISKO CREEK AT PEKISKO.

Location.—On the NW. $\frac{1}{4}$ Sec. 8, Tp. 17, Rge. 2, W. 5th Mer., at George Lane's Bar U ranch, and about twenty-five miles southwest of High River.

Records available.—October 6, 1911, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero of gauge is 93.90 feet, unchanged since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Fairly permanent.

Discharge measurements.—Made from a small suspension footbridge or by wading.

Winter flow.—Observations not taken during winter months.

Diversions.—The headgates of George Lane's irrigation ditch are about one and one-half miles upstream from station. Ditch flowing continuously from July 22, 1914, to August 14, 1914.

Observer.—F. R. Pike.

DISCHARGE MEASUREMENTS of Pekisko Creek at Pekisko, in 1914.

Date.	Engineer..	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 12.....	J. S. Tempest.....	50	118.0	0.58	1.54	69.0
May 26.....	H. S. Kerby.....	48	109.0	0.55	1.57	60.0
June 21.....	do.....	46	36.0	1.06	1.37	38.0
July 17.....	do.....	41	36.3	0.42	1.20	15.2
Aug. 15.....	do.....	17	6.7	0.70	0.98	4.7
Sept. 7.....	do.....	17	8.8	0.52	1.00	4.6
Sept. 25.....	do.....	20	9.6	0.70	1.08	6.7
Oct. 24.....	do.....	51	44.2	0.72	1.45	32.0

DAILY GAUGE HEIGHT AND DISCHARGE of Pekisko Creek at Pekisko, for 1914.

DAY.	April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.60	72	1.48	53	1.60	72.0
2.....			1.61	74	1.46	50	1.52	59.0
3.....			1.66	82	1.46	50	1.46	50.0
4.....			1.60	72	1.48	53	1.41	42.0
5.....			1.50	56	1.49	54	1.45	48.0
6.....			1.46	50	1.52	59	1.44	46.0
7.....	1.55	64	1.50	56	1.53	61	1.40	40.0
8.....	1.38	37	1.50	56	1.51	57	1.36	34.0
9.....	1.35	33	1.60	72	1.44	46	1.35	33.0
10.....	1.32	29	1.66	82	1.44	46	1.33	30.0
11.....	1.36	34	1.63	77	1.48	53	1.31	27.0
12.....	1.52	59	1.64	78	1.50	56	1.28	24.0
13.....	1.54	62	1.63	77	1.47	51	1.28	24.0
14.....	1.48	53	1.63	77	1.51	57	1.24	19.0
15.....	1.44	46	1.65	80	1.49	54	1.23	18.0
16.....	1.46	50	1.64	78	1.44	46	1.20	15.0
17.....	1.36	34	1.63	77	1.42	43	1.18	13.4
18.....	1.33	30	1.63	77	1.40	40	1.18	13.4
19.....	1.29	25	1.63	77	1.38	37	1.17	12.6
20.....	1.37	36	1.65	80	1.38	37	1.16	12.6
21.....	1.37	36	1.65	80	1.36	34	1.15	11.0
22.....	1.37	36	1.64	78	1.37	36	1.10	7.7
23.....	1.40	40	1.63	77	1.35	33	1.08	6.9
24.....	1.58	68	1.62	75	1.36	34	0.98	4.5
25.....	1.53	61	1.61	74	1.66	82	0.94	4.1
26.....	1.48	53	1.59	70	1.88	117	0.94	4.1
27.....	1.45	48	1.56	66	1.88	117	0.93	4.0
28.....	1.46	50	1.55	64	1.80	104	0.95	4.2
29.....	1.50	56	1.52	59	1.74	93	0.96	4.3
30.....	1.47	51	1.50	56	1.67	83	0.97	4.4
31.....			1.48	53			0.94	4.1

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Pekisko Creek at Pekisko, for 1914.—*Continued*

DAY.	August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.94	4.1	0.98	4.5	1.15	11.0
2.....	0.92	3.9	0.98	4.5	1.16	11.8
3.....	0.90	3.8	0.97	4.4	1.18	13.4
4.....	0.93	4.0	0.96	4.3	1.21	16.0
5.....	0.91	3.9	0.98	4.5	1.23	18.0
6.....	0.91	3.9	0.98	4.5	1.23	18.0
7.....	0.95	4.2	0.98	4.5	1.25	20.0
8.....	0.94	4.1	1.05	5.7	1.27	22.0
9.....	0.94	4.1	1.05	5.7	1.29	25.0 ^a
10.....	1.08	6.0	1.05	5.7	1.31	26.0
11.....	1.03	4.7	1.02	5.1	1.33	28.0
12.....	0.98	4.5	1.05	5.7	1.35	30.0
13.....	0.96	4.3	1.05	5.7	1.40	36.0
14.....	0.95	4.2	1.06	6.1	1.46	44.0
15.....	0.98	4.5	1.07	6.5	1.71	80.0
16.....	1.00	4.7	1.08	6.9	1.86	109.0
17.....	1.08	6.9	1.10	7.7	1.86	108.0
18.....	1.08	6.9	1.10	7.7	1.82	100.0
19.....	1.06	6.1	1.10	7.7	1.76	88.0
20.....	1.02	5.1	1.11	8.4	1.66	72.0
21.....	1.00	4.7	1.10	7.7	1.59	58.0
22.....	1.01	4.9	1.08	6.9	1.55	50.0
23.....	1.06	6.1	1.08	6.9	1.50	41.0
24.....	1.06	6.1	1.05	5.7	1.46	36.0 ^a
25.....	1.06	6.1	1.08	6.9	1.44	31.0
26.....	1.03	5.3	1.09	7.3	1.41	27.0
27.....	1.00	4.7	1.11	8.4	1.38	23.0
28.....	1.00	4.7	1.13	9.7	1.37	22.0
29.....	1.00	4.7	1.13	9.7	1.35	19.0
30.....	1.00	4.7	1.15	11.0	1.32	16.0
31.....	1.00	4.7	.....	.....	1.31	15.0

^a Shifting conditions from Oct. 9 to 24.

MONTHLY DISCHARGE of Pekisko Creek at Pekisko, for 1914.

(Drainage area 99 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (7-30).....	68.0	25.0	45.0	0.450	0.40	2,141
May.....	82.0	50.0	71.0	0.718	0.83	4,366
June.....	117.0	33.0	58.0	0.586	0.65	3,451
July.....	72.0	4.1	22.0	0.224	0.26	1,352
August.....	6.9	3.8	5.0	0.051	0.06	307
September.....	11.0	4.3	6.5	0.066	0.07	387
October.....	109.0	11.0	39.0	0.394	0.45	2,398
The period.....	.....	.....	.....	.....	2.72	14,402

STIMSON CREEK NEAR PEKISKO.

Location.—On the NW. $\frac{1}{4}$ Sec. 2, Tp. 17, Rge. 2, W. 5th Mer., at E. R. Baker's ranch, about three miles east of Pekisko post office.

Records available.—From October 6th, 1911, to October 31, 1914.

Gauge.—Staff; elevation of zero of gauge maintained at 90.20 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation 100.00 feet.

Channel.—Fairly permanent.

Discharge measurements.—By wading or from bridge.

Winter flow.—No observations taken during winter months.

Observer.—E. R. Baker.

DISCHARGE MEASUREMENTS of Stimson Creek near Pekisko, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 11.....	J. S. Tempest.....	39.5	23.6	1.68	.....^b	39.8
June 21.....	H. S. Kerby.....	30.0	25.2	0.32	1.34	7.6
July 15.....	do.....	19.0	6.0	0.37	1.36	2.2
Aug. 14.....	do.....	.....	.....	.....	0.94	Nil ^a
Sept. 7.....	do.....	.....	.....	.....	0.65	Nil ^a
Sept. 25.....	do.....	.....	.....	.....	1.02	Nil ^a
Oct. 23.....	do.....	19.0	8.7	0.58	1.33	5.0

^a Water standing in pools.

^b Gauge height not read.

DAILY GAUGE HEIGHT AND DISCHARGE of Stimson Creek near Pekisko, for 1914.

DAY.	June.		July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.71	26.0	1.49	12.0	1.03	Nil	0.66	Nil	1.14	0.40
2.....	1.69	24.0	1.40	7.0	1.02	"	0.67	"	1.13	0.30
3.....	1.65	22.0	1.45	9.0	1.02	"	0.67	"	1.04	Nil
4.....	1.60	18.0	1.42	7.5	1.00	"	0.67	"	1.03	"
5.....	1.59	17.4	1.45	8.5	0.98	"	0.66	"	1.35	4.80
6.....	1.60	18.0	1.54	13.0	0.97	"	0.67	"	1.42	7.50
7.....	1.57	16.0	1.54	13.0	0.97	"	0.67	"	1.42	7.50
8.....	1.62	19.4	1.51	11.0	0.97	"	0.67	"	1.42	7.50
9.....	1.59	17.4	1.47	8.5	0.92	"	0.67	"	1.32	3.70
10.....	1.62	19.4	1.42	6.5	0.98	"	0.67	"	1.42	7.50
11.....	1.62	19.4	1.41	5.0	1.02	"	0.71	"	1.52	12.80
12.....	1.64	21.0	1.39	4.5	1.01	"	0.70	"	1.52	12.80
13.....	1.66	22.0	1.37	3.5	0.99	"	0.70	"	1.32	12.80
14.....	1.70	25.0 ^a	1.32	2.0	0.96	"	0.71	"	.....	.....
15.....	1.74	30.0	1.35	2.3	0.94	"	0.70	"	.....	.....
16.....	1.69	27.0	1.38	3.0	0.92	"	0.71	"	.....	.....
17.....	1.69	28.0	1.36	3.0	1.02	"	0.67	"	.....	.....
18.....	1.66	26.0	1.34	3.0	1.05	"	0.67	"	.....	.....
19.....	1.64	26.0	1.28	2.0	1.05	"	0.67	"	.....	.....
20.....	1.50	16.0	1.27	2.0	1.02	"	0.66	"	.....	.....
21.....	1.34	7.6	1.26	2.0	1.02	"	0.70	"	.....	.....
22.....	1.25	4.2	1.22	2.2 ^a	1.04	"	0.70	"	.....	.....
23.....	1.44	15.2	1.19	0.9	1.02	"	0.70	"	.....	.....
24.....	1.45	13.0	1.17	0.7	1.02	"	0.71	"	.....	.....
25.....	1.60	25.0	1.14	0.4	1.00	"	1.12	0.20	.....	.....
26.....	2.43	148.0	1.12	0.2	0.97	"	1.12	0.20	.....	.....
27.....	2.06	78.0	1.09	Nil	0.97	"	1.12	0.20	.....	.....
28.....	1.80	40.0	1.07	"	0.95	"	1.15	0.50	.....	.....
29.....	1.73	30.0	1.05	"	0.95	"	1.15	0.50	.....	.....
30.....	1.65	23.0	1.05	"	0.97	"	1.30	3.00	.....	.....
31.....	.....	.....	1.04	"	0.91	"	.....	.....	.....	.....

^a to ^a Shifting conditions.

SESSIONAL PAPER No. 25c

MONTHLY DISCHARGE of Stimson Creek near Pekisko, for 1914.

(Drainage area 78 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
June.....	148.0	4.2	27.00	0.346	0.39	1,607
July.....	13.0	0.0	4.30	0.055	0.06	264
August.....						Nil.
September.....	3.0	0.0	1.05	0.013	0.01	62
October (1-13).....	12.8	0.0	6.00	0.077	0.04	155
The period.....					0.50	2,088

FINDLAY AND MCDUGAL DITCH FROM HIGHWOOD RIVER.

Location.—On SW. $\frac{1}{4}$ Sec. 31, Tp. 18, Rge. 29, W. 4th Mer., about four and one-half miles west of the town of High River.

Records available.—June 17, 1911, to October 25, 1914.

Gauge.—Vertical staff on left bank; elevation of zero of gauge 99.25 feet, unchanged since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Soft mud, liable to shift.

Discharge measurements.—By wading.

Winter flow.—Ditch closed off at freeze-up.

Artificial control.—Discharge at station may be controlled by means of the headgates about one-quarter mile above station.

Observer.—No observations of daily gauge height during 1914.

DISCHARGE MEASUREMENTS of Findlay-McDougal Ditch from Highwood River, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 22.....	H. S. Kerby.....	9.0	4.0	1.24	1.35	5.00
Aug. 18.....	do.....	8.0	5.1	0.79	1.46	4.00
Sept. 5.....	do.....	6.0	2.9	0.58	1.10	1.70
Sept. 24.....	do.....	8.0	4.4	0.76	1.28	3.30

LITTLE BOW DITCH AT HIGH RIVER.

Location.—On the SW. $\frac{1}{4}$ Sec. 6, Tp. 19, Rge. 28, W. 4th Mer., about 100 feet from the power station and pumping plant of the town of High River.

Records available.—August 1, 1910, to December 31, 1914.

Gauge.—Staff; elevation of zero of gauge maintained at 91.06 feet during 1910-11; 92.06 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Fairly permanent.

Discharge measurements.—Made by wading.

Winter flow.—Continuous records kept during winter.

Artificial control.—Formed by headgates of ditch about one mile above station.

Observer.—Philip Weinard.

DISCHARGE MEASUREMENTS of Little Bow Ditch at High River, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 13.	J. S. Tempest.	12.5	10.1	2.12	0.93	22.00
Feb. 17.	do	12.7	17.6	0.93	1.65	16.40
Feb. 28.	do	13.3	12.8	1.54	1.01	19.90
April 10.	do	13.0	8.8	1.63	0.66	14.10
April 26.	do				0.38	0.02a
May 4.	do					Nil.
May 28.	do	17.7	24.6	1.07	1.15	26.20
June 22.	H. S. Kerby	17.5	24.5	1.19	1.04	29.20
July 13.	do	16.0	19.8	0.86	0.75	17.20
Aug. 11.	do	17.0	20.6	0.88	0.82	18.20
Sept. 8.	do	16.0	16.9	0.73	0.55	12.40
Sept. 25.	do	16.0	15.2	0.67	0.55	10.20
Oct. 22.	do	15.0	13.6	0.63	0.45	8.58
Nov. 13.	do	16.0	13.9	0.63	0.45	8.84
Dec. 10.	R. J. McGuinness	13.9	13.4	0.63	0.61	8.37

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Little Bow Ditch at High River, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	0.94	11.6a	1.44	14.0	0.95	16.5	0.74	15.9a	0.88	20.0	1.18	30
2.	1.15	12.8	1.32	9.5	0.95	18.0	1.05	26.0	0.99	23.0	1.25	32
3.	1.00	12.2	1.50	12.0	1.00	16.7	0.85	19.1	1.05	26.0	1.40	38
4.	0.95	11.7	1.30	13.0	0.92	16.8	0.84	18.8	1.00	24.0	1.53	44
5.	1.00	11.0	1.30	10.0	0.90	17.0	0.95	22.0	0.95	22.0	1.30	34
6.	0.95	11.0	1.00	8.2	1.00	17.0	0.95	22.0	0.94	22.0	1.21	31
7.	0.92	10.8	1.30	8.4	0.77	16.0	0.90	21.0	0.90	21.0	1.20	31
8.	0.90	10.9	1.30	9.2	0.80	16.2	0.76	16.5	0.80	17.6	1.11	28
9.	0.83	11.0	1.45	10.8	0.95	17.0	0.70	14.8	0.92	21.0	1.06	26
10.	2.00	11.0	1.44	12.0	0.95	17.1	0.75	16.2	1.08	27.0	1.04	25
11.	1.43	11.0	1.62	12.4	0.75	15.0	0.75	16.2	1.04	25.0	1.20	31
12.	1.37	12.4	1.65	13.0	0.98	16.0	0.75	16.2	0.97	23.0	1.05	26
13.	0.90	22.0	1.75	14.0	1.05	17.0	0.75	16.2	1.00	24.0	1.05	26
14.	0.90	18.6	1.60	15.0	1.05	17.0	0.72	15.4	1.05	26.0	1.15	29
15.	0.90	13.4	1.64	15.5	1.10	17.0	0.71	15.1	1.15	29.0	1.15	29
16.	0.83	12.5	1.67	16.0	1.15	17.0	0.77	16.8	1.20	31.0	1.14	28
17.	0.90	12.2	1.63	16.6	1.10	17.0	0.75	16.2	1.24	32.0	1.18	30
18.	0.94	12.0	1.60	17.0	1.00	16.6	0.74	15.9	1.24	32.0	1.19	30
19.	1.68	11.5	1.50	17.3	0.97	16.4	0.73	15.6	1.24	32.0	1.15	29
20.	1.75	11.4	1.55	17.4	1.04	16.4	0.75	16.2	1.20	31.0	1.43	40
21.	1.24	11.0	1.30	16.9	1.45	16.2	0.75	16.2	1.20	31.0	1.06	26
22.	0.94	10.5	1.45	16.5	0.80	16.2	0.75	16.2	1.17	30.0	1.35	36
23.	1.05	11.0	1.40	17.6	0.75	16.0	0.75	16.2	1.18	30.0	0.95	22
24.	1.16	12.0	1.34	18.2	0.75	15.0	0.79	17.3	1.19	30.0	0.89	20
25.	1.15	13.0	1.40	18.8	0.72	14.2	0.80	17.6	1.25	32.0	1.00	24
26.	1.25	13.8	1.37	19.1	0.70	14.9	0.80	17.6	1.24	32.0	1.10	27
27.	1.45	12.8	1.00	19.4	0.90	16.6	0.84	18.8	1.20	31.0	1.00	24
28.	1.36	11.6	1.15	19.6	0.95	16.7	0.81	17.9	1.17	30.0	0.95	22
29.	1.30	11.0			0.85	16.8	0.84	18.8	1.10	27.0	0.92	21
30.	1.30	13.0			0.74	16.8	0.84	18.8	1.06	26.0	0.94	22
31.	1.57	15.0			0.74	16.8			1.09	27.0		

a Ice conditions Jan. 1 to April 1.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE OF Little Bow Ditch at High River, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.	0.90	21.0	0.94	22.0	0.55	11.0	0.54	10.8	0.42	8.2	0.35	12.3
2.	0.90	21.0	0.94	22.0	0.54	10.8	0.54	10.8	0.41	8.0	0.32	11.3
3.	0.90	21.0	0.90	21.0	0.50	9.8	0.54	10.8	0.42	8.2	0.28	10.5
4.	0.90	21.0	0.84	18.8	0.53	10.5	0.61	12.5	0.42	8.2	0.36	9.8
5.	0.95	22.0	0.85	19.1	0.50	9.8	0.65	13.5	0.46	9.0	0.36	9.3
6.	1.05	26.0	0.84	18.8	0.50	9.8	0.54	10.8	0.41	8.0	0.35	9.0
7.	1.04	25.0	0.90	21.0	0.52	10.2	0.55	11.0	0.90	21.0	0.29	8.7
8.	1.10	27.0	0.83	18.5	0.52	10.2	0.51	10.0	0.54	10.8	0.43	8.5
9.	0.83	18.5	0.83	18.5	0.54	10.8	0.55	11.0	0.42	8.2	0.56	8.5
10.	0.91	21.0	0.85	19.1	0.54	10.8	0.55	11.0	0.40	7.8	0.63	8.4
11.	0.94	22.0	0.81	17.9	0.57	11.5	0.55	11.0	0.40	7.8	0.61	8.4
12.	0.79	17.3	0.75	16.2	0.57	11.5	0.51	10.0	0.40	7.8	0.81	8.6
13.	0.76	16.5	0.75	16.2	0.53	10.5	0.51	10.0	0.35	6.8	0.86	9.2
14.	0.74	15.9	0.69	14.6	0.55	11.0	0.51	10.0	0.54	10.8	0.83	9.7
15.	0.66	13.8	0.67	14.0	0.55	11.0	0.51	10.0	0.62	12.7	0.80	9.9
16.	0.60	12.2	0.65	13.5	0.55	11.0	0.51	10.0	0.55	11.0	0.73	9.8
17.	0.59	11.9	0.66	13.8	0.55	11.0	0.56	11.2	0.60	12.2	0.60	9.6
18.	0.58	11.7	0.66	13.8	0.54	10.8	0.56	11.2	0.82	13.2a	0.57	9.4
19.	1.70	51.0	0.65	13.5	0.54	10.8	0.55	11.0	0.85	13.8	0.55	9.0
20.	1.33	36.0	0.60	12.2	0.54	10.8	0.55	11.0	0.80	14.3	0.51	8.8
21.	1.33	36.0	0.60	12.2	0.54	10.8	0.47	9.2	0.67	14.3	0.46	8.5
22.	1.33	36.0	0.58	11.7	0.55	11.0	0.47	9.2	0.62	13.8	0.36	8.0
23.	1.11	28.0	0.55	11.0	0.55	11.0	0.46	9.0	0.56	13.4	0.41	7.8
24.	1.10	27.0	0.56	11.2	0.54	10.8	0.44	8.6	0.55	13.5	0.35	7.7
25.	1.05	26.0	0.58	11.7	0.55	11.0	0.44	8.6	0.64	14.0	0.35	7.6
26.	1.00	24.0	0.55	11.0	0.55	11.0	0.44	8.6	0.54	14.1	0.36	7.6
27.	1.00	24.0	0.55	11.0	0.55	11.0	0.44	8.6	0.54	13.8	0.36	7.6
28.	0.98	23.0	0.55	11.0	0.56	11.2	0.43	8.4	0.44	13.4	0.36	7.9
29.	0.96	23.0	0.55	11.0	0.55	11.0	0.44	8.6	0.56	13.5	0.36	7.9
30.	0.95	22.0	0.55	11.0	0.54	10.8	0.41	8.6	0.56	13.5	0.40	7.6
31.	0.95	22.0	0.55	11.0			0.44	8.6			0.35	7.4a

a Ice conditions Nov. 18 to Dec. 31.

MONTHLY DISCHARGE OF Little Bow Ditch at High River, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	
				Total in Acre-feet.
January.	22.0	10.5	12.4	762
February.	19.6	8.2	14.6	811
March.	18.0	14.2	16.4	1,008
April.	26.0	14.8	17.6	1,047
May.	32.0	17.6	27.0	1,660
June.	44.0	20.0	29.0	1,726
July.	51.0	11.7	23.0	1,414
August.	22.0	11.0	15.1	928
September.	11.5	9.8	10.7	637
October.	13.5	8.4	10.1	621
November.	21.0	6.8	11.5	684
December.	12.3	7.4	8.8	541
The year.				11,839

HIGHWOOD RIVER AT HIGH RIVER.

Location.—On the NW. $\frac{1}{4}$ Sec. 6, Tp. 19, Rge. 28, W. 4th Mer., at the new steel traffic bridge in the town of High River.

Records available.—May 28, 1908, to December 31, 1914.

Gauge.—Chain gauge; elevation of zero of gauge maintained at 3,381.66 feet during 1908-13; 3,379.74 feet during 1914.

Bench-mark.—Permanent iron bench-mark 128 feet N. 60° E. from SE. corner of stream face of right abutment; elevation, 3,389.60 feet above mean sea level (Canadian Pacific Railway Company).

Channel.—Fairly permanent.

Discharge measurements.—From bridge.

Diversions.—The Little Bow Ditch diverts water about two miles above the station.

Observer.—Philip Weinard.

DISCHARGE MEASUREMENTS of Highwood River at High River, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 13.....	J. S. Tempest.....	23.5	19.2	4.27	1.88	82
Feb. 17.....	do.....	34.5	27.9	1.88	2.18	52
Feb. 28.....	do.....	37.0	36.3	1.64	2.14	60
April 10.....	do.....	135.0	414.0	0.65	2.20	271
May 26.....	H. S. Kerby.....	139.0	524.0	1.98	3.42	1,041
June 20.....	do.....	142.0	629.8	2.13	3.63	1,336
July 14.....	do.....	137.0	342.0	1.82	4.60	620a
Aug. 11.....	do.....	117.0	254.0	0.92	4.05	222
Sept. 9.....	do.....	110.0	225.0	0.57	3.73	128
Sept. 26.....	do.....	112.0	237.0	0.72	3.86	171
Oct. 22.....	do.....	120.0	280.0	1.16	4.22	325
Nov. 13.....	do.....	.....	.....	.....	3.67	..... b
Dec. 9.....	R. J. McGuinness.....	75.0	155.0	0.33	3.25	51

a Station moved to present position on July 14.

b Unable to measure on account of slush ice.

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at High River, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.77	78a	2.04	52	2.13	60	1.93	107	2.49	365	3.40	1,040
2.....	1.90	84	2.07	50	2.14	60	2.21	119	2.80	540	3.62	1,272
3.....	1.96	83	1.99	47	2.14	60	2.14	131	3.12	778	4.01	1,701
4.....	1.96	84	2.02	45	2.16	60	2.35	141	3.07	736	4.21	1,921
5.....	2.16	85	2.15	43	2.13	61	2.48	156	2.95	645	3.92	1,602
6.....	2.14	84	2.17	44	2.10	61	2.70	171	2.81	547	3.79	1,459
7.....	2.11	83	2.17	44	2.10	61	2.38	186	2.78	528	3.79	1,459
8.....	2.10	81	2.18	45	2.10	61	2.10	204	2.68	468	3.62	1,272
9.....	1.98	80	2.20	47	2.08	61	2.18	225a	2.80	540	3.47	1,110
10.....	1.87	78	2.20	49	2.05	60	2.18	233	3.17	823	3.29	931
11.....	1.86	79	2.23	50	2.04	62	2.23	252	3.20	850	3.32	960
12.....	1.90	81	2.25	49	2.14	65	2.32	288	3.02	696	3.36	1,030
13.....	1.94	82	2.28	50	2.23	69	2.43	335	3.02	696	3.37	1,010
14.....	1.96	83	2.27	57	2.50	71	2.46	350	3.12	778	3.64	1,294
15.....	1.99	83	2.25	57	2.48	71	2.33	292	3.32	960	3.68	1,338
16.....	1.98	82	2.21	56	2.25	70	2.42	330	3.42	1,060	3.73	1,393
17.....	1.95	77	2.16	52	2.15	69	2.42	330	3.49	1,130	3.82	1,492
18.....	1.95	69	2.14	50	2.04	68	2.43	335	3.52	1,162	3.82	1,492
19.....	1.94	62	2.14	49	1.83	67	2.27	268	3.53	1,173	3.77	1,437
20.....	1.92	59	2.07	49	1.91	66	2.25	260	3.47	1,110	3.63	1,283
21.....	1.90	56	2.08	49	1.90	65	2.27	268	3.42	1,060	3.48	1,120
22.....	1.90	55	2.10	50	1.87	66	2.29	276	3.39	1,030	3.30	940
23.....	1.89	54	2.13	52	1.87	66	2.22	248	3.40	1,040	3.18	832
24.....	1.87	53	2.16	54	1.84	64	2.49	365	3.45	1,090	3.08	744
25.....	1.85	51	2.17	58	1.79	62	2.47	355	3.60	1,250	3.16	814
26.....	1.84	49	2.19	60	1.76	61	2.47	355	3.62	1,272	3.64	1,294
27.....	1.85	47	2.20	60	1.75	62	2.46	350	3.57	1,217	3.51	1,151
28.....	1.86	46	2.13	60	1.73	66	2.41	325	3.42	1,060	3.39	1,030
29.....	2.06	47	.....	.....	1.78	71	2.41	325	3.31	950	3.33	970
30.....	2.06	50	1.83	81	2.41	325	3.20	850	3.25	895
31.....	2.04	52	1.86	92	3.22	868

a Ice conditions Jan. 1 to April 9.

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DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River at High River, for 1914.—*Continued.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.23	877	3.97	196	3.79	143	3.71	127	4.01	210	3.54	113
2.....	3.22	868	3.92	181	3.79	143	3.71	127	4.04	225	3.42	102
3.....	3.21	859	3.92	181	3.77	139	3.76	137	4.05	230	3.36	104
4.....	3.21	859	3.99	202	3.77	139	4.01	210	4.01	210	3.58	108
5.....	3.24	886	3.93	184	3.66	119	4.11	210	4.01	210	3.51	101
6.....	3.28	922	3.91	178	3.65	118	4.06	235	4.05	230	3.08	96
7.....	3.23	877	3.96	193	3.70	125	4.01	210	3.87	166	3.26	83
8.....	3.11	769	3.96	193	3.80	145	4.06	235	3.92	181	2.97	61
9.....	3.01	688	3.96	193	3.76	137	4.05	230	3.96	193	3.25	51
10.....	2.93	631	4.02	215	3.76	137	4.10	255	4.01	210	3.29	51
11.....	2.91	617	3.96	193	3.80	145	4.01	210	4.01	210	3.25	54
12.....	2.88	596	3.96	193	3.65	117	4.05	230	4.00	205	3.20	59
13.....	2.84	568	3.92	181	3.78	141	4.01	210	3.64	116	3.35	61
14.....	4.73 ^a	753	3.87	166	3.75	135	4.00	205	3.64	116	3.39	62
15.....	4.63	650	3.87	166	3.67	121	4.10	255	3.49	100	3.50	65
16.....	4.58	602	3.82	151	3.77	139	4.29	368	3.40	98 ^b	3.57	71
17.....	4.48	514	3.92	181	3.73	131	4.52	548	3.31	96	3.53	76
18.....	4.40	450	3.92	181	3.75	135	4.57	593	3.48	104	3.52	80
19.....	4.40	450	3.92	181	3.64	116	4.57	593	3.72	120	3.52	82
20.....	4.30	375	3.92	181	4.03	220	4.47	506	3.85	139	3.60	84
21.....	4.35	412	3.87	166	3.82	151	4.43	474	3.81	150	3.53	85
22.....	4.30	375	3.87	166	3.73	131	4.31	383	3.90	152	3.58	86
23.....	4.26	347	3.86	163	3.77	139	4.29	368	3.76	152	3.57	87
24.....	4.21	312	3.87	166	3.77	139	4.24	333	3.86	154	3.60	88
25.....	4.20	305	3.87	166	3.77	139	4.19	300	4.13	200	3.64	89
26.....	4.16	285	3.78	141	3.82	151	4.15	280	4.00	178	3.63	90
27.....	4.10	255	3.77	139	3.82	151	4.14	275	4.03	174	3.64	90
28.....	4.10	255	3.73	131	3.78	141	4.10	255	3.96	168	3.63	90
29.....	4.06	235	3.78	141	3.86	163	4.10	255	3.75	152	3.61	91
30.....	4.06	235	3.78	141	3.86	163	4.05	230	3.74	124	3.60	92
31.....	4.06	235	3.79	143			4.05	230			3.64	93 ^b

^a Gauge read at new station from July 14.^b Ice conditions Nov. 16 to Dec. 31.

MONTHLY DISCHARGE of Highwood River at High River, for 1914.

(Drainage area 746 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	85	46	69	0.092	0.11	4,243
February.....	60	43	51	0.068	0.07	2,832
March.....	92	60	66	0.088	0.10	4,058
April.....	365	107	264	0.354	0.40	15,709
May.....	1,272	365	880	1.180	1.36	54,109
June.....	1,921	744	1,209	1.620	1.81	71,940
July.....	922	235	550	0.737	0.85	33,818
August.....	215	131	173	0.232	0.27	10,637
September.....	220	116	140	0.188	0.21	8,331
October.....	593	127	293	0.393	0.45	18,016
November.....	230	96	165	0.221	0.25	9,818
December.....	113	51	825	0.110	0.13	5,042
The year.....					6.01	238,553

HIGHWOOD RIVER NEAR ALDERSYDE.

Location.—On NW. $\frac{1}{4}$ Sec. 17, Tp. 20, Rge. 2S, W. 4th Mer., at L. W. Barret's ranch, about three miles NE. of Aldersyde.

Records available.—From October 3, 1911, to October 31, 1914.

Gauge.—Standard chain gauge; elevation of zero of the gauge is 90.64 feet, unchanged since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Large stones and boulders in and near section.

Discharge measurements.—From traffic bridge or by wading.

Winter flow.—No observations taken during winter months.

Observer.—L. W. Barret.

DISCHARGE MEASUREMENTS of Highwood River, near Aldersyde, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 9.....	J. S. Tempest.....	90	182	1.16	1.79	211
May 25.....	H. S. Kerby.....	175	359	3.18	2.32	1,141
June 16.....	do.....	180	418	3.36	2.63	1,415
July 10.....	do.....	155	283	2.69	1.95	762
Aug. 10.....	do.....	125	156	1.32	1.17	220
Sept. 1.....	do.....	85	98	1.36	0.96	132
Sept. 21.....	do.....	111	126	1.51	1.15	189
Oct. 16.....	do.....	132	193	1.64	1.45	344

DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River near Aldersyde, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.85	150	1.37	302	2.13	919
2.....			2.07	160	1.77	572	2.33	1,140
3.....			2.12	163	1.97	758	2.48	1,325
4.....			2.05	160	2.02	807	3.08	2,135
5.....			2.32	180	1.97	758	2.86	1,830
6.....			3.07	230	1.79	589	2.62	1,509
7.....			3.20	240	1.67	492	2.63	1,522
8.....			2.56	202	1.62	455	2.58	1,455
9.....			2.26	211a	1.71	523	2.50	1,350
10.....			1.60	441	2.02	807	2.36	1,176
11.....			1.31	270	2.09	878	2.23	1,026
12.....			1.26	245	2.02	807	2.23	1,026
13.....			1.46	352	1.88	671	2.30	1,105
14.....			1.42	329	2.01	797	2.38	1,201
15.....	2.55	a	1.36	296	2.07	857	2.51	1,363
16.....	2.54		1.34	286	2.32	1,129	2.56	1,428
17.....	2.52		1.36	296	2.29	1,094	2.58	1,455
18.....	2.45		1.35	291	2.35	1,164	2.60	1,482
19.....	2.29		1.28	255	2.37	1,188	2.63	1,522
20.....	2.23		1.29	260	2.32	1,129	2.53	1,389
21.....	1.94		1.20	217	2.33	1,140	2.49	1,337
22.....	1.90		1.16	201	2.30	1,105	2.47	1,312
23.....	1.92		1.21	222	2.28	1,083	2.27	1,071
24.....	1.88		1.31	270	2.21	1,004	2.15	940
25.....	1.87		1.48	364	2.30	1,105	2.12	909
26.....	1.86		1.46	352	2.43	1,262	2.57	1,442
27.....	1.85		1.36	296	2.31	1,117	2.47	1,312
28.....	1.84		1.39	313	2.30	1,105	2.32	1,129
29.....	1.83		1.37	302	2.21	1,004	2.30	1,105
30.....	1.82		1.38	307	2.08	868	2.27	1,071
31.....	1.84				2.06	847		

a Ice conditions March 15 to April 9. Discharge estimated April 1 to 9.

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DAILY GAUGE HEIGHT AND DISCHARGE of Highwood River near Aldersyde, for 1914.

--Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.25	1,048	1.25	240	0.90	118	1.14	193
2.....	2.22	1,015	1.22	226	0.89	116	1.15	197
3.....	2.21	1,004	1.21	222	0.87	111	1.16	201
4.....	2.18	972	1.20	217	0.88	113	1.20	217
5.....	2.21	1,001	1.21	222	0.87	111	1.22	226
6.....	2.26	1,059	1.19	213	0.89	116	1.25	240
7.....	2.21	1,004	1.19	213	0.90	118	1.26	245
8.....	2.14	930	1.20	217	0.92	123	1.28	255
9.....	2.09	878	1.22	226	0.94	128	1.28	255
10.....	2.09	878	1.25	240	0.93	126	1.30	265
11.....	2.00	787	1.22	226	0.93 _a	126	1.27	250
12.....	1.93	719	1.18	209	0.92	123	1.24	235
13.....	1.90	690	1.10	178	0.95	131	1.25	240
14.....	1.92	709	1.95	160	1.00	145	1.27	250
15.....	1.89	681	1.03	154	1.02	151	1.27	250
16.....	1.87	662	1.00	145	1.03	154	1.45	346
17.....	1.87	662	1.40	318	1.03	154	1.66	485
18.....	1.74	547	1.10	178	1.05	160	1.74	547
19.....	1.68	500	1.08	171	1.02	151	1.75	555
20.....	1.64	470	1.06	164	1.09	174	1.65	477
21.....	1.60	441	1.05	160	1.10	178	1.59	434
22.....	1.56	414	1.05 _a	160	1.09	174	1.53	395
23.....	1.51	382	1.05	160	1.09 _a	174	1.46	352
24.....	1.48	364	1.07	167	1.10	178	1.41	324
25.....	1.43	335	1.04	157	1.10 _a	178	1.39	313
26.....	1.41 _a	324	1.03	154	1.10	178	1.36	296
27.....	1.39 _a	313	1.00	145	1.12	186	1.32	275
28.....	1.36	296	0.98	140	1.15	197	1.32	275
29.....	1.34	286	0.97	137	1.13	189	1.30	265
30.....	1.32	275	0.98	140	1.14	193	1.28	255
31.....	1.26	245	0.96 _a	134	.....	.....	1.26	245

_a Gauge height interpolated.

MONTHLY DISCHARGE of Highwood River near Aldersyde, for 1914.

(Drainage area 883 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches in Drainage Area.	Total in Acre-feet.
April.....	441	150	262	0.297	0.33	15,590
May.....	1,262	302	884	1.090	1.15	54,355
June.....	2,135	909	1,300	1.473	1.64	77,355
July.....	1,059	245	642	0.727	0.84	39,475
August.....	318	134	187	0.212	0.24	11,498
September.....	197	111	149	0.169	0.19	8,866
October.....	555	193	302	0.342	0.39	18,569
The period.....	.....	.....	.....	.....	4.78	225,702

BOW RIVER NEAR NAMAKA.

Location.—On the NE. $\frac{1}{4}$ Sec. 32, Tp. 21, Rge. 25, W. 4th Mer., about one-half mile below the Southern Alberta Land Company's dam.

Records available.—From September, 1909, to October, 1910. From May 13, 1913, to August 22, 1914.

Gauge.—Inclined staff; elevation of zero of gauge is 2,952.00 feet, unchanged since establishment.

Bench-mark.—Permanent iron bench-mark; elevation, 2,962.92 feet above mean sea level (C.P.R. datum); located about 25 feet NE. of cable tower on the right bank.

Channel.—Permanent.

Discharge measurements.—By means of cable and car.

Winter flow.—No observations during the winter.

Artificial control.—Opening or closing gates on Southern Alberta Land Company's canal will affect discharge at station.

Diversions.—Southern Alberta Land Company's headgates for their main canal are about one-half mile upstream.

Co-operation.—The Southern Alberta Land Company supplied the gauge heights and also took some discharge measurements.

DISCHARGE MEASUREMENTS of Bow River near Namaka, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 22.....	J. S. Tempest.....	291	1,279	1.54	55.48	1,960
April 16.....	T. H. Hatch (S.A.L. Co.)....	337	1,293	2.38	56.20	3,080
May 6.....	do.....	339	1,292	2.54	56.30	3,292
May 9.....	H. S. Kerby.....	340	1,276	2.42	56.35	3,088
May 22.....	T. H. Hatch (S.A.L. Co.)....	349	1,719	3.59	57.60	6,174
June 3.....	H. S. Kerby.....	352	1,784	4.02	58.00	7,107
June 26.....	do.....	357	2,178	4.45	59.00	9,696
June 22.....	T. H. Hatch (S.A.L. Co.)....	366	2,443	4.90	59.35	12,030
July 4.....	do.....	366	2,305	4.77	59.15	11,243
July 7.....	do.....	364	2,508	5.44	59.65	13,691
July 25.....	H. S. Kerby.....	350	1,812	3.42	57.70	6,184
July 29.....	T. H. Hatch (S.A.L. Co.)....	349	1,681	3.32	57.45	5,584
Aug. 22.....	H. S. Kerby.....	343	1,463	2.63	56.80	3,862
Oct. 3.....	do.....	333	1,345	2.25	56.50	3,030

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DAILY GAUGE HEIGHT AND DISCHARGE of Bow River near Namaka, for 1914.

DAY.	April.		May.		June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			5.60	2,050	7.90 ^a	6,750	8.60	9,050	7.30	5,050
2.....			5.90	2,425	7.95 ^a	6,900	8.70	9,400	7.30	5,050
3.....			6.00	2,550	8.00	7,050	8.80	9,750	7.35	5,175
4.....			6.00	2,550	8.60	9,050	9.20	11,300	7.40	5,300
5.....			6.50	3,325	9.20	11,300	9.40	12,110	7.45	5,425
6.....			6.40	3,150	9.50	12,500	9.70	13,400	7.45	5,425
7.....			6.50	3,325	9.20	11,300	9.70	13,400	7.30	5,050
8.....			6.30	3,000	9.10	10,900	9.50	12,500	7.35	5,175
9.....			6.30	3,000	8.90	10,100	9.20	11,300	7.40	5,300
10.....			6.50	3,325	8.80	9,750	9.10	10,900	7.40	5,300
11.....			6.90	4,125	8.70	9,400	9.00	10,500	7.20	4,800
12.....			6.60	3,500	8.60	9,050	8.90	10,100	7.10	4,575
13.....			6.70	3,700	8.80	9,750	8.00	7,050	7.00	4,350
14.....			6.90	4,125	9.80	13,850	9.00	10,500	6.95	4,237
15.....			7.00	4,350	9.90	14,300	9.10	10,900	6.95	4,237
16.....			7.00	4,350	10.10	15,200	9.20	11,300	6.90	4,125
17.....	6.28	2,970	7.50	5,550	10.20	15,650	9.00	10,500	7.00	4,350
18.....	5.98	2,525	7.70	6,150	10.10	15,200	8.60	9,050	7.10	4,575
19.....	5.78	2,275	7.70	6,150	9.90	14,300	8.40	8,350	7.05	4,162
20.....	5.68	2,150	7.60	5,850	9.70	13,400	8.20	7,650	6.95	4,237
21.....	5.58	2,030	7.60	5,850	9.60	12,950	8.40	8,350	6.85	4,012
22.....	5.48	1,930	7.50	5,550	9.40	12,100	8.40	8,350	6.85 ^b	4,012
23.....	5.48	1,930	7.50	5,550	9.20	11,300	8.10	7,350		
24.....	5.48	1,930	7.50 ^a	5,550	9.00	10,500	7.85	6,600		
25.....	5.68	2,150	7.55 ^a	5,700	9.00	10,500	7.70	6,150		
26.....	5.68	2,150	7.60 ^a	5,850	9.00	10,500	7.67	6,060		
27.....	5.78	2,275	7.65 ^a	6,000	9.00	10,500	7.55	5,700		
28.....	5.78	2,275	7.70 ^a	6,150	8.60	9,050	7.35	5,175		
29.....	5.58	2,030	7.75 ^a	6,300	8.20	7,650	7.40	5,300		
30.....	5.60	2,050	7.80 ^a	6,450	8.20	7,650	7.40	5,300		
31.....			7.85 ^a	6,600			7.35	5,175		

^a Gauge heights interpolated.^b Observations discontinued Aug. 22.

NOTE.—Add 2,950.00 to gauge heights to get elevation above sea level.

MONTHLY DISCHARGE of Bow River near Namaka, for 1914.

(Drainage area 6,208 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet
April (17-30).....	2,970	1,930	2,191	0.353	0.183	60,732
May.....	6,600	2,050	4,584	0.738	0.851	281,858
June.....	15,650	6,750	10,947	1.763	1.967	651,400
July.....	13,400	5,175	8,984	1.447	1.668	552,410
August (1-22).....	5,425	4,012	4,724	0.761	0.622	206,077
The period.....					5.291	1,752,477

BOW RIVER NEAR BASSANO.

Location.—On SE. $\frac{1}{4}$ of Sec. 2, Tp. 21, Rge. 19, W. 4th Mer., about one-half mile downstream from Canadian Pacific Railway Company's dam, and about three miles southwest of the town of Bassano.

Records available.—August 20, 1909, to December 31, 1914.

Gauge.—Staff; elevation of zero of gauge 2,519.43 feet during 1909-10; 2,517.90 feet during 1911-12; 2,513.60 feet during 1913; 2,510.68 feet during 1914.

Bench-mark.—Permanent iron bench-mark; elevation 2,524.29 feet above mean sea level (Canadian Pacific Railway Company).

Channel.—Permanent.

Discharge measurements.—By cable and car.

Winter flow.—Records taken during winter season.

Artificial control.—Formed by Canadian Pacific Railway Company's dam one-half mile upstream.

Diversions.—Eastern section of Canadian Pacific Railway Company's Irrigation Canal diverts water about one-half mile upstream.

Co-operation.—Gauge heights supplied by Canadian Pacific Railway Company.

DISCHARGE MEASUREMENTS of Bow River near Bassano, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 12.....	H. S. Kerby.....	574	2,603	1.57	3.26	4,081
June 7.....	do.....	590	3,597	3.29	5.71	11,830
June 23.....	do.....	590	3,249	2.69	4.96	8,750
July 27.....	do.....	560	2,676	1.84	3.90	4,902
Aug. 25.....	do.....	557	2,458	1.57	3.41	3,851
Sept. 15.....	do.....	512	2,035	1.10	2.64	2,244
Oct. 10.....	do.....	545	2,252	1.45	3.16	3,278
Oct. 28.....	do.....	532	2,119	1.23	2.84	2,601
Nov. 27.....	R. McGuinness.....	565	2,220	1.26	2.94	2,802
Dec. 15.....	do.....	500	1,487	0.43	1.73	640

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DAILY GAUGE HEIGHT AND DISCHARGE OF Bow River near Bassano, for 1914.

DAY.	June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	5.96	12,740	4.86	8,360	3.79	4,820	3.66	4,450
2.....	5.66	11,540	4.86	8,360	3.79	4,820	3.56	4,200
3.....	5.26	9,940	4.86	8,360	3.78	4,790	3.56	4,200
4.....	5.46	10,740	5.06	9,140	3.78	4,790	3.56	4,200
5.....	5.46	10,740	5.46	10,740	3.78	4,790	3.56	4,200
6.....	5.86	12,340	5.66	11,540	3.67	4,475	2.46	1,940
7.....	5.86	12,340	6.06	13,140	3.67	4,475	2.46	1,940
8.....	5.66	11,540	6.06	13,140	3.67	4,475	2.46	1,940
9.....	5.46	10,740	5.66	11,540	3.67	4,475	2.66	2,240
10.....	5.46	10,740	5.46	10,740	3.66	4,450	2.66	2,240
11.....	5.66	11,540	5.26	9,940	3.66	4,450	2.66	2,240
12.....	5.96	12,740	5.27	9,980	3.76	4,730	2.45	1,925
13.....	5.86	12,340	5.27	9,980	3.86	5,030	2.25	1,625
14.....	5.86	12,340	5.07	9,180	3.86	5,030	2.45	1,925
15.....	6.16	13,540	5.27	9,980	3.86	5,030	2.65	2,225
16.....	6.06	13,140	5.47	10,780	3.96	5,330	2.65	2,225
17.....	6.16	13,540	5.48	10,820	3.96	5,330	3.05	3,000
18.....	6.26	13,940	4.88	8,430	3.96	5,330	3.25	3,425
19.....	6.36	14,340	4.88	8,430	3.86	5,030	3.05	3,000
20.....	6.06	13,140	4.68	7,730	3.76	4,730	3.05	3,000
21.....	5.86	12,340	4.68	7,730	3.66	4,450	2.86	2,620
22.....	5.86	12,340	4.79	8,115	3.66	4,450	2.66	2,240
23.....	6.16	13,540	4.69	7,765	3.66	4,450	2.46	1,940
24.....	6.16	13,540	4.79	8,115	3.66	4,450	2.66	2,240
25.....	6.16	13,540	4.29	6,365	3.76	4,730	2.86	2,620
26.....	5.86	12,340	4.09	5,720	3.76	4,730	3.06	3,020
27.....	5.46	10,740	4.00	5,450	3.46	3,950	3.06	3,020
28.....	5.66	11,540	4.10	5,750	3.46	3,950	3.06	3,020
29.....	4.86	8,360	3.80	4,850	3.46	3,950	3.06	3,020
30.....	4.86	8,360	3.80	4,850	3.66	4,450	2.86	2,620
31.....			3.79	4,820	3.66	4,450		

DAILY GAGE HEIGHT AND DISCHARGE OF BOW RIVER near Bassano, for 1914.—*Continued.*

DAY.	October		November		December.	
	Gauge-Height.	Dis-charge.	Gauge-Height.	Dis-charge.	Gauge-Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	3.06	3,020	2.66	2,240	2.62	2,180
2	2.86	2,620	2.56	2,090	2.42	1,880
3	2.86	2,620	2.46	1,840	2.22	1,580
4	3.06	3,020	2.66	2,240	2.22	1,580
5	2.86	2,620	2.66	2,240	2.02	1,370
6	2.86	2,620	2.66	2,240	1.81	1,190
7	2.86	2,620	1.96	1,340	1.76	1,060
8	2.86	2,620	1.96	1,340	1.56	800
9	2.86	2,620	2.66	2,240	1.46	700
10	3.06	4,430	2.46	1,940	1.36	620
11	3.46	3,950	2.68	2,270	1.36	550
12	3.06	3,020	2.68	2,270	1.46	550
13	2.86	2,620	2.78	2,120	1.56	480
14	3.26	3,450	2.48	1,970	1.66	600
15	3.00	3,020	2.52	2,030	1.66	640
16	3.26	3,450	2.55	2,075	1.76	800
17	3.46	3,950	2.78	2,120	1.66	750
18	3.06	4,430	2.62	2,180	1.66	1,000
19	3.06	4,430	2.66	2,240	1.90	1,000
20	3.46	3,950	2.76	2,300	1.80	950
21	3.36	3,700	2.73	2,360	1.80	950
22	3.26	3,450	2.76	2,420	1.90	1,000
23	3.06	3,020	2.86	2,500	1.90	1,000
24	2.86	2,620	2.83	2,560	1.80	950
25	3.06	3,020	2.86	2,620	1.80	950
26	3.06	3,020	2.88	2,660	1.90	1,000
27	3.06	3,020	2.92	2,740	1.90	1,000
28	2.86	2,620	2.92	2,740	2.10	1,100
29	2.96	2,820	2.82	2,540	2.10	1,140
30	2.76	2,420	2.72	2,340	2.10	1,190
31	2.76	2,420			2.40	1,200

c Gauge height interpolated.

MONTHLY DISCHARGE OF BOW RIVER near Bassano, for 1914.

(Drainage area 7,613 square miles.)

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
June	14,340	8,360	12,621	1,579	1.76	715,310
July	13,140	4,820	8,706	1,145	1.32	552,250
August	5,560	3,950	4,738	0,612	0.71	286,408
September	4,450	1,625	2,730	0,361	0.40	163,640
October	4,450	2,420	3,138	0,412	0.48	192,948
November	2,740	1,310	2,228	0,293	0.33	132,572
December	2,180	550	1,027	0,135	0.16	63,150
The period					5.10	2,089,278

NORTH BRANCH OF CANADIAN PACIFIC RAILWAY CANAL NEAR BASSANO.

Location.—On NW $\frac{1}{4}$ Sec. 3, Tp. 21, Rge. 18, W. 4th Mer., about five miles southeast of the town of Bassano, and about three and one-half miles east of the Bassano dam.

Records available.—From May 1, 1914, to October 31, 1914.

Gauge.—Hand gauge read from mark on bridge.

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Bench-mark.—Top of left abutment of gauging bridge; assumed elevation, 100.00 feet.

Channel.—Permanent concrete channel.

Discharge measurements.—From gauging bridge or by wading underneath

Winter flow.—Ditch closed off at freeze-up.

Artificial control.—Discharge at station may be controlled by means of the headgates about 400 feet above the station.

Co-operation.—Gauge heights supplied by Canadian Pacific Railway Company.

DISCHARGE MEASUREMENTS of North Branch of Canadian Pacific Railway Company Canal near Bassano, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 5	H. S. Kerby	33	30.9	1.09	1.07	34
June 28	do	35	34.8	1.46	1.50	64
July 28	do	34	37.8	1.44	1.20	54
Aug. 24	do					<i>a</i>
Sept. 14	do					<i>a</i>
Oct. 10	do					<i>a</i>
Oct. 29	do	33	27.0	1.15	0.95	31

a Headgates closed; canal dry.

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Canadian Pacific Railway Company Canal near Bassano, for 1914.

DAY.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1	1.0	33	1.5	65	1.5	65	1.4	58			1.5	65
2	1.0	33	1.6	73	1.2	45	2.7	169			1.5	65
3	1.0	33	1.6	73	1.2	45	1.6	73				<i>a</i>
4	1.0	33	1.6	73	1.2	45	1.6	73				
5	1.0	33	1.4	58	1.2	45	1.6	73				
6	0.5	12	1.9	97	1.2	45	1.6	73				
7		<i>a</i>	1.9	97	1.2	45	1.6	73				
8			1.9	97	1.2	45	1.6	73				
9			1.9	97	1.2	45	1.6	73				
10		<i>a</i>	1.9	97	1.2	45	1.6	73				
11	1.0	33	1.9	97	1.4	58	1.6	73				
12	1.0	33	1.9	97	1.4	58	1.6	73		<i>a</i>		
13	1.0	33	1.9	97	1.4	58	1.6	73	0.3	6		
14	1.0	33	1.9	97	1.4	58	1.6	73	0.3	6		
15	1.3	51	1.9	97	1.4	58	1.6	73	1.0	33		
16	1.3	51	1.9	97	1.4	58		<i>a</i>	1.0	33		
17	1.3	51	1.9	97	1.4	58			1.0	33		
18	1.3	51	1.9	97	1.4	58			1.0	33		
19	1.3	51	1.9	97	1.4	58			1.0	33		
20	1.3	51	1.9	97	1.4	58			1.3	51		
21	1.3	51	1.8	89	1.4	58			1.3	51		
22	1.3	51	1.8	89	1.4	58			1.5	65		
23	1.3	51	1.8	89	1.4	58			1.5	65		<i>a</i>
24	1.3	51	1.8	89	1.4	58			1.5	65	1.0	33
25	1.3	51	1.5	65	1.4	58			1.5	65	1.0	33
26	1.5	65	1.0	33	1.4	58			1.5	65	1.0	33
27	1.5	65	1.0	33	1.4	58			1.5	65	1.0	33
28	1.5	65	1.5	65	1.4	58			1.5	65	1.0	33
29	1.5	65	1.5	65	1.4	58			1.5	65	1.0	33
30	1.5	65	1.5	65	1.4	58			1.5	65	1.0	33
31	1.5	65			1.4	58					1.0	33

a Headgates closed from May 6 to 11; from Aug. 15 to Sept. 13; and from Oct. 2 to 24.

MONTHLY DISCHARGE of North Branch Canadian Pacific Railway Company's Canal near Bassano, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF. Total in Acre-feet.
	Maximum.	Minimum.	Mean.	
May.....	65	41	2,520
June.....	97	33	83	4,939
July.....	65	45	54	3,320
August.....	169	38	2,336
September.....	65	29	1,726
October.....	65	13	799
The period.....	15,640

EAST BRANCH OF CANADIAN PACIFIC RAILWAY COMPANY CANAL NEAR BASSANO.

Location.—On SE. $\frac{1}{4}$ Sec. 3, Tp. 21, Rge. 18, W. 4th Mer., about 400 feet from headgates of East Branch and about three and one-half miles east of the Bassano dam.

Records available.—May 28, 1914, to November 1, 1914.

Gauge.—Head gauge read from mark on bridge.

Bench-mark.—Top of left abutment of gauging bridge; assumed elevation, 100.00 feet.

Channel.—Permanent concrete channel.

Discharge measurements.—From gauging bridge or by wading underneath.

Winter flow.—Ditch closed off at freeze-up.

Artificial control.—Discharge may be controlled by means of the headgates about 250 feet above station.

Co-operation.—Gauge heights supplied by the Canadian Pacific Railway Company.

DISCHARGE MEASUREMENTS of East Branch of Canadian Pacific Railway Company Canal near Bassano, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 5.....	H. S. Kerby.....	69	40.4	0.76	0.59	29
June 28.....	do.....	73	92.6	1.21	1.40	112
July 28.....	do.....	76	163.0	1.48	2.30	242
Aug. 24.....	do.....	.....	.....	.....	.....	^a
Sept. 16.....	do.....	75	102.0	1.14	1.45	116
Oct. 10.....	do.....	73	70.6	1.10	1.05	78
Oct. 29.....	do.....	82	254.0	1.91	3.40	486

^a Headgates closed; canal dry.

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DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Canadian Pacific Railway
Company Canal near Bassano, for 1914.

DAY.	May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1			1.5	122	1.0	68
2			1.5	122	1.5	122
3			1.3	98	1.7	148
4			0.9	59	2.0	192
5			0.9	59	2.0	192
6			1.2	88	2.0	192
7			1.2	88	2.2	224
8			0.6	34	2.4	260
9			0.6	34	2.5	280
10			0.6	34	2.5	280
11			0.6	34	2.5	280
12			1.0	68	2.5	280
13			1.0	68	2.5	280
14			1.0	68	2.5	280
15			1.0	68	2.5	280
16			1.0	68	2.5	280
17			1.0	68	2.5	280
18			1.9	177	2.5	280
19			1.9	177	2.5	280
20			1.0	68	2.5	280
21			1.0	68	2.5	280
22			0.8	50	2.5	280
23			1.4	110	2.5	280
24			1.6	134	2.5	280
25			1.5	122	2.5	280
26			1.5	122	2.5	280
27			1.5	122	2.5	280
28	0.9	59	1.5	122	2.5	280
29	1.2	88	1.5	122	2.5	280
30	1.2	88	1.5	122	2.5	280
31	1.5	122			2.5	280

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Canadian Pacific Railway
Company Canal near Bassano, for 1914.—*Conclud d.*

DAY.	August.		September.		October.		November.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	2.8	342			3.0	388	3.5	512
2	2.8	342			3.0	388	2.0	192
3	2.8	342			3.0	388	1.6	134
4	2.8	342			1.5	122	1.6	134
5	2.8	342			1.5	122	1.6	134
6	2.8	342			1.3	98	1.6	134
7	2.8	342			1.0	68	1.0	68
8	2.8	342	0.3	14	1.0	68	1.0	68
9	2.8	342	0.3	14	1.0	68	1.0	68
10	2.8	342	1.0	68	1.0	68	0.5	27
11	2.8	342	1.5	122	1.0	68	0.5	27
12	2.8	342	2.0	192	1.0	68		a
13	2.8	342	2.0	192	1.0	68		
14	2.8	342	2.4	260	1.0	68		
15	2.8	342	2.5	280	1.0	68		
16		a	2.5	280	1.0	68		
17			2.5	280	1.0	68		
18			2.5	280	1.0	68		
19			2.5	280	1.5	122		
20			2.5	280	2.0	192		
21			3.0	388	3.0	388		
22			3.0	388	3.5	512		
23			3.0	388	3.5	512		
24			3.0	388	3.5	512		
25			3.0	388	3.5	512		
26			3.0	388	3.5	512		
27			3.0	388	3.5	512		
28			3.0	388	3.5	512		
29			3.0	388	3.5	512		
30			3.0	388	3.5	512		
31					3.5	512		

a Headgates closed; canal dry.

MONTHLY DISCHARGE of East Branch of Canadian Pacific Railway Company Canal near
Bassano, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF. Total in Acre-feet.
	Maximum.	Minimum.	Mean.	
May (28-31)	122	59	89	706
June	177	34	90	5,355
July	280	68	253	15,566
August	342	0	165	10,145
September	388	0	214	12,734
October	512	68	263	16,171
November	512	0	50	2,975
The period				63,642

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MISCELLANEOUS DISCHARGE MEASUREMENTS made in Bow River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Fect.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
May 14.....	H. C. Ritchie...	Beaupré Creek	SE. 15-26-5-5.	.....	.....	.....	0.50a
June 11.....	do	do	do	4.5	1.33	2.08	2.80
July 9.....	do	do	do	4.5	0.85	0.72	0.61
Aug. 6.....	do	do	do	.....	.....	.....	Nil b
Aug. 20.....	do	do	do	.....	.....	.....	Nil b
Sept. 10.....	do	do	do	.....	.....	.....	Nil b
Sept. 24.....	do	do	do	.....	.....	.....	Nil b
Oct. 8.....	do	do	do	.....	.....	.....	Nil b
Oct. 21.....	do	do	do	.....	.....	.....	Nil b
May 14.....	do	Bighill Creek	SW. 10-26-4-5.	11.8	4.87	1.45	7.10
June 11.....	do	do	do	12.5	7.05	1.59	11.20
Aug. 6.....	do	do	do	11.3	4.05	0.94	3.80
Aug. 20.....	do	do	do	11.5	4.55	1.19	5.40
Sept. 10.....	do	do	do	11.3	4.87	1.07	5.20
Sept. 24.....	do	do	do	12.0	5.10	1.14	5.80
Oct. 8.....	do	do	do	12.0	5.40	1.20	6.40
Oct. 21.....	do	do	do	12.2	5.74	1.28	7.30
May 15.....	do	Chiniki Creek	Morley Indian Reserve	6.8	1.38	0.88	1.22
July 10.....	do	do	do	4.7	1.64	0.68	1.12
April 8.....	J. S. Tempest...	Fish Creek	SE. 22-22-3-5.	58.6	38.60	0.79	30.50
Oct. 21.....	H. S. Kerby....	(North Branch)	26-22-3-5.	37.0	23.90	0.30	6.80
April 8.....	J. S. Tempest...	Fish Creek	SE. 22-22-3-5.	28.0	23.10	1.49	34.00
July 8.....	H. S. Kerby....	(South Branch)	NE. 22-22-3-5	32.0	30.80	0.88	27.00
July 8.....	do	do	do	40.0	30.20	0.62	18.80
Oct. 21.....	do	do	do	26-22-3-5	3.3	26.90	0.55
May 14.....	H. C. Ritchie...	Grand Valley Creek	SW. 24-26-5-5	5.3	1.55	0.97	1.50
June 11.....	do	do	do	11.0	3.85	1.80	6.30
July 9.....	do	do	do	5.5	1.45	1.28	1.86
Aug. 6.....	do	do	do	.....	.....	.....	Nil c
Aug. 20.....	do	do	do	.....	.....	.....	0.50
Sept. 10.....	do	do	do	.....	.....	.....	1.00a
Sept. 24.....	do	do	do	.....	.....	.....	1.00a
Oct. 8.....	do	do	do	.....	.....	.....	1.00a
Oct. 21.....	do	do	do	5.2	1.43	0.99	1.41
May 14.....	do	Horse Creek	NE. 8-26-4-5.	.....	.....	.....	0.75
June 11.....	do	do	do	10.0	5.10	0.50	2.60
July 9.....	do	do	do	.....	.....	.....	0.25
Aug. 6.....	do	do	do	.....	.....	.....	Nil c
Aug. 20.....	do	do	do	.....	.....	.....	Nil c
Sept. 10.....	do	do	do	.....	.....	.....	Nil b
Sept. 24.....	do	do	do	.....	.....	.....	Nil b
Oct. 8.....	do	do	do	.....	.....	.....	Nil b
Oct. 21.....	do	do	do	.....	.....	.....	Nil b
July 9.....	H. S. Kerby....	Pine Creek	10-22-1-5	.....	.....	.....	0.28
Aug. 8.....	do	do	do	.....	.....	.....	Nil c
Oct. 21.....	do	do	do	.....	.....	.....	Nil c
May 14.....	H. C. Ritchie...	Spencer Creek	SE. 18-26-5-5.	7.5	2.27	1.12	2.60
June 11.....	do	do	do	7.0	2.25	1.20	2.70
July 9.....	do	do	do	7.0	1.90	1.24	2.40
Aug. 6.....	do	do	do	7.3	1.99	1.07	2.10
Aug. 20.....	do	do	do	7.3	1.99	1.06	2.10
Sept. 10.....	do	do	do	7.3	1.87	0.92	1.73
Sept. 24.....	do	do	do	7.4	2.14	1.15	2.40
Oct. 8.....	do	do	do	7.6	2.16	1.24	2.70
Oct. 21.....	do	do	do	7.0	1.80	0.94	1.69
April 7.....	J. S. Tempest...	Spring Creek	NE. 15-20-2-5	5.0	2.20	0.68	1.50
June 11.....	R. H. Goodchild	do	4-26-2-5	.....	.....	.....	0.06
July 15.....	H. S. Kerby....	do	do	.....	.....	.....	Nil
Aug. 13.....	do	do	do	.....	.....	.....	Nil
Aug. 18.....	do	Tongueflag Creek	Near Finlay's Ranch	.....	.....	.....	0.05
Sept. 26.....	H. C. Ritchie...	Whiteman's Creek	Canmore (above intake of Coal Co.)	12.1	9.92	0.61	6.00
Sept. 26.....	do	do	Canmore (near foot of falls)	4.3	3.73	1.56	5.80
Sept. 26.....	do	do	Canmore (near creek mouth)	5.2	2.94	1.89	5.60
Nov. 21.....	do	do	NW. 24-24-11-5.	10.1	12.20	0.52	6.30
Dec. 5.....	do	do	do	9.8	12.50	0.55	6.80
Dec. 29.....	do	do	do	10.0	7.40	0.73	5.40

a Estimated.

b Creek dry.

c Water standing in pools.

LITTLE BOW RIVER DRAINAGE BASIN.

General Description.

The source of Little Bow River is a spring in the town of High River in Sec. 6, Tp. 19, Rgc. 2S, W. 4th Mer. From here it flows in a southeasterly direction for 100 miles and empties into the Belly River. In the first few miles, the natural flow is dependent entirely on a number of small springs and coulees which are dry most of the year, but later is augmented by the flow from Mosquito Creek, which drains the south and westerly part of the drainage basin.

There is a comparatively large flow in this stream during the spring freshets, but during summer it would under natural conditions dry up. There are a large number of ranchers and settlers on this stream, and it is very important that there should be a good flow for domestic and stock watering purposes. For this reason the Provincial Government has constructed a canal, and diverts water from Highwood River into Little Bow River whenever required.

MOSQUITO CREEK NEAR NANTON.

Location.—On the NE. $\frac{1}{4}$ Sec. 30, Tp. 16, Rgc. 2S, W. 4th Mer., about four miles from Nanton.

Records available.—August 1st, 1908, to October 31st, 1914. Discharge measurements from 1906.

Gauge.—Vertical staff; elevation of zero maintained at 89.22 feet during 1908-12, and at 89.47 feet during 1913-14.

Bench-marks.—Permanent iron bench-mark.

Channel.—Liable to shift.

Discharge measurements.—Made from the bridge at flood stages; by wading during low water.

Winter flow.—Station not maintained during the winter.

Observer.—Wm. Monkman.

DISCHARGE MEASUREMENTS of Mosquito Creek near Nanton, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 2.....	F. R. Burfield.....	51.0	45.80	1.84	3.35	84.00
April 21.....	J. E. Caughey.....	25.0	19.60	0.76	2.38	14.90
May 7.....	do.....	17.0	7.70	1.13	2.21	8.70
May 28.....	do.....	12.0	5.40	0.67	2.11	3.60
June 19.....	do.....	10.0	2.50	0.26	1.90	0.66
July 2.....	do.....	10.0	3.30	0.43	2.02	1.39
July 18.....	do.....				1.78	1.39
July 31.....	do.....				Dry	Nil ^a
Aug. 17.....	do.....				"	"
Sept. 17.....	do.....				"	"
Sept. 28.....	do.....				"	"
Oct. 20.....	do.....	16.0	7.20	0.82	2.11	6.00

^a Water standing in pools.

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DAILY GAUGE HEIGHT AND DISCHARGE of Mosquito Creek near Nanton, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.80	42.0	2.28	10.0	2.08	3.00
2.....	3.35	84.0	2.29	10.4	2.07	2.80
3.....	3.30	80.0	2.28	10.0	2.07	2.80
4.....	3.39	87.0	2.27	9.5	2.05	2.40
5.....	3.29	79.0	2.26	9.1	2.01	1.60
6.....	3.18	70.0	2.24	8.3	2.05	2.40
7.....	3.33	82.0	2.22	7.4	2.01	1.60
8.....	3.33	82.0	2.24	8.3	1.99	1.30
9.....	3.37	86.0	2.26	9.1	1.98	1.20
10.....	3.36	85.0	2.54	25.0	1.99	1.30
11.....	3.21	73.0	2.49	21.0	2.01	1.60
12.....	3.15	68.0	2.47	20.0	1.99	1.30
13.....	3.05	61.0	2.41	16.6	1.98	1.20
14.....	2.88	48.0	2.39	15.5	1.99	1.30
15.....	2.75	35.0	2.34	12.9	2.01	1.60
16.....	2.68	34.0	2.38	15.0	1.98	1.20
17.....	2.62	30.0	2.35	13.4	1.97	1.10
18.....	2.41	16.6	2.35	13.4	1.96	1.00
19.....	2.40	16.0	2.35	13.4	1.97	1.10
20.....	2.40	16.0	2.34	12.9	1.93	0.70
21.....	2.38	15.0	2.33	12.4	1.94	0.80
22.....	2.36	13.9	2.30	10.8	1.92	0.60
23.....	2.36	13.9	2.25	8.7	1.90	0.40
24.....	2.35	13.4	2.23	7.9	1.87	0.28
25.....	2.35	13.4	2.20	6.6	1.90	0.40
26.....	2.35	13.4	2.15	5.0	2.32	11.80
27.....	2.33	12.4	2.11	3.7	2.37	14.40
28.....	2.29	10.4	2.11	3.7	2.37	14.40
29.....	2.32	11.8	2.09	3.2	2.22	7.40
30.....	2.30	10.8	2.07	2.8	2.12	4.00
31.....			2.07	2.8		

DAILY GAUGE HEIGHT AND DISCHARGE of Mosquito Creek near Nanton, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.10	3.40	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	2.04	2.20	"	"	"	"	"	"
3.....	1.97	1.10	"	"	"	"	"	"
4.....	1.97	1.10	"	"	"	"	"	"
5.....	1.94	0.80	"	"	"	"	"	"
6.....	1.92	0.60	"	"	"	"	"	"
7.....	1.97	1.10	"	"	"	"	2.32	14.7
8.....	1.94	0.80	"	"	"	"	2.33	15.2
9.....	1.94	0.80	"	"	"	"	2.35	16.3
10.....	1.95	0.90	"	"	"	"	2.37	17.4
11.....	1.94	0.80	"	"	"	"	2.38	17.9
12.....	1.92	0.60	"	"	"	"	2.40	19.0
13.....	1.91	0.50	"	"	"	"	2.38	17.9
14.....	1.89	0.36	"	"	"	"	2.37	17.4
15.....	1.87	0.28	"	"	"	"	2.33	15.2
16.....	1.85	0.20	"	"	"	"	2.32	14.7
17.....	1.80	Nil.	"	"	"	"	2.27	12.2
18.....	1.80	"	"	"	"	"	2.23	10.4
19.....	Dry.	"	"	"	"	"	2.17	8.0
20.....	"	"	"	"	"	"	2.11	6.0
21.....	"	"	"	"	"	"	2.10	5.6
22.....	"	"	"	"	"	"	2.05	4.4
23.....	"	"	"	"	"	"	2.05	4.4
24.....	"	"	"	"	"	"	2.00	3.2
25.....	"	"	"	"	"	"	2.02	3.7
26.....	0 "	"	"	"	"	"	2.02	3.7
27.....	"	"	"	"	"	"	2.05	4.4
28.....	"	"	"	"	"	"	2.00	3.2
29.....	"	"	"	"	"	"	2.05	4.4
30.....	"	"	"	"	"	"	2.00	3.2
31.....	"	"	"	"	"	"	2.00	3.2

MONTHLY DISCHARGE of Mosquito Creek near Nanton, for 1914.

(Drainage area 186 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	87.0	10.40	43.500	0.234	0.260	2,588
May.....	25.0	2.80	10.600	0.057	0.066	652
June.....	14.4	0.28	2.900	0.016	0.018	173
July.....	3.4	Nil.	0.501	0.003	0.004	31
August.....	"	"	"	"	"	Nil.
September.....	"	"	"	"	"	Nil.
October.....	19.0	Nil.	7.930	0.043	0.050	488
The period.....	"	"	"	"	0.398	3,932

NANTON CREEK NEAR NANTON.

Location.—On the SE. $\frac{1}{4}$ Sec. 19, Tp. 16, Rge. 28, W. 4th Mer., at highway bridge.*Records available.*—August 3, 1908, to October 31, 1914.*Gauge.*—Vertical staff; zero of gauge maintained at 82.18 feet during 1908-11; 82.57 feet during 1912; 93.33 feet during 1913; 92.31 feet during 1914.

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Bench-mark.—Permanent iron bench-mark.

Channel.—Not liable to shift.

Discharge measurements.—Made upstream by wading.

Observer.—W. Monkman.

DISCHARGE MEASUREMENTS of Nanton Creek near Nanton, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 2	F. R. Burfield	14.5	16.50	0.67	3.91	10.90
April 21	J. E. Caughey	11.0	5.88	0.81	1.96	4.80
May 7	do	10.0	3.99	0.61	1.84	2.40
May 28	do	10.5	2.49	0.44	1.73	1.09
June 19	do	5.0	0.90	0.20	1.62	0.18
July 2	do	6.0	2.10	0.34	1.72	0.71
July 18	do				1.57	0.01
July 31	do				Dry.	Nil.
Aug. 17	do				"	"
Sept. 17	do				1.65	0.76
Sept. 28	do				Dry.	Nil.
Oct. 20	do	6.0	1.90	0.90	1.75	1.71

DAILY GAUGE HEIGHT AND DISCHARGE of Nanton Creek near Nanton, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1			1.92	3.90	1.69	0.59
2	3.65	10.9 ^a	1.90	3.50	1.68	0.52
3	3.67	11.2	1.90	3.50	1.67	0.46
4	3.40	20.0 ^a	1.89	3.30	1.65	0.32
5	3.05	29.0	1.88	3.10	1.66	0.39
6	3.00	28.0	1.88	3.10	1.65	0.32
7	3.00	28.0	1.89	3.30	1.63	0.23
8	3.00	28.0	1.85	2.60	1.65	0.32
9	3.00	28.0	2.05	6.80	1.63	0.23
10	2.94	26.0	2.00	5.70	1.61	0.14
11	2.90	26.0	1.98	5.30	1.61	0.14
12	2.90	26.0	1.96	4.80	1.60	0.10
13	2.60	18.9	1.92	3.90	1.62	0.19
14	2.42	14.9	1.92	3.90	1.61	0.14
15	2.38	14.1	1.92	3.90	1.61	0.14
16	2.03	6.4	1.91	3.70	1.64	0.28
17	2.00	5.7	1.91	3.70	1.62	0.19
18	1.94	4.4	1.92	3.90	1.65	0.32
19	1.94	4.4	1.91	3.70	1.62	0.19
20	1.96	4.8	1.92	3.90	1.61	0.14
21	1.96	4.8	1.90	3.50	1.61	0.14
22	1.94	4.4	1.85	2.60	1.60	0.10
23	1.94	4.4	1.82	2.10	1.60	0.10
24	1.93	4.2	1.80	1.80	1.59	0.07
25	1.93	4.2	1.75	1.16	1.59	0.07
26	1.90	3.5	1.70	0.66	1.82	2.10
27	1.91	3.7	1.71	0.76	1.91	3.70
28	1.90	3.5	1.73	0.96	1.88	3.10
29	1.91	3.7	1.71	0.76	1.84	2.40
30	1.91	3.7	1.70	0.66	1.82	2.10
31			1.70	0.66		

^a to a Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Nanton Creek near Nanton, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.82	2.10	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	1.87	2.90	"	"	"	"	"	"
3.....	1.82	2.10	"	"	"	"	"	"
4.....	1.81	2.00	"	"	"	"	"	"
5.....	1.84	2.40	"	"	"	"	"	"
6.....	1.82	2.10	"	"	"	"	"	"
7.....	1.81	2.00	"	"	"	"	2.35	13.40
8.....	1.77	1.42	"	"	"	"	2.38	14.10
9.....	1.74	1.06	"	"	"	"	2.32	12.70
10.....	1.70	0.66	"	"	"	"	2.30	12.30
11.....	1.64	0.28	1.70	0.66	"	"	2.25	11.20
12.....	1.62	0.19	1.68	0.52	"	"	2.23	10.80
13.....	1.60	0.10	1.65	0.32	"	"	2.17	9.40
14.....	1.59	0.07	1.63	0.23	"	"	2.10	7.90
15.....	1.58	0.04	1.58	0.04	"	"	2.08	7.50
16.....	1.57	0.01	1.57	0.01	"	"	2.04	6.60
17.....	1.57	0.01	1.70	0.66	1.63	0.23	2.01	5.90
18.....	1.57	0.01	1.68	0.52	1.62	0.19	1.90	3.50
19.....	Dry.	Nil.	1.65	0.32	1.60	0.10	1.83	2.30
20.....	"	"	1.64	0.28	1.58	0.04	1.75	1.16
21.....	"	"	1.63	0.23	1.57	0.01	1.75	1.16
22.....	"	"	1.61	0.14	Dry.	Nil.	1.73	0.96
23.....	"	"	1.60	0.10	"	"	1.72	0.86
24.....	"	"	1.60	0.10	"	"	1.72	0.86
25.....	"	"	1.59	0.07	"	"	1.71	0.76
26.....	"	"	1.59	0.07	"	"	1.71	0.76
27.....	"	"	1.58	0.04	"	"	1.70	0.66
28.....	"	"	1.57	0.01	"	"	1.70	0.66
29.....	"	"	1.56	"	"	"	1.70	0.66
30.....	"	"	Dry.	Nil.	"	"	1.69	0.59
31.....	"	"	"	"	"	"	1.69	0.59

MONTHLY DISCHARGE of Nanton Creek near Nanton, for 1914.

(Drainage area 46 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	29.00	3.50	12.90	0.280	0.31	768
May.....	6.80	0.66	3.10	0.067	0.08	191
June.....	3.70	0.07	0.64	0.014	0.02	38
July.....	2.90	Nil.	0.63	0.014	0.02	39
August.....	0.66	"	0.14	0.003	0.00	9
September.....	0.23	"	0.02	0.000	0.00	1
October.....	14.10	"	4.10	0.089	0.10	252
The period.....					0.53	1,298

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MISCELLANEOUS DISCHARGE MEASUREMENTS made in Little Bow River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
April 11...	J. S. Tempest	Spring Creek	NE. 10-17-1 5.				0.25
April 11...	do	do	NE. 10-17 1 5. ^a	4.7	2.66	0.47	1.27
July 16...	H. S. Kerby.	do	NE. 10-17 1 5.				0.21
Aug. 14...	do	do	do				0.14
Oct. 23...	do	do	do				0.34
June 18...	R. H. Goodchild	Springhill Creek	SE. 11-16-29-4..				0.30

a Combined springs below McMillan's ranch.

OLDMAN RIVER DRAINAGE BASIN.

General Description.

Oldman River, one of the principal tributaries of the South Saskatchewan River, is formed in the Livingstone Range of the Rocky Mountains by the junction of four small rivers, viz., Livingstone, Northwest Branch, West Branch and Racehorse Creek; and flows in a south and easterly direction to near Cowley, where it is joined by the Crowsnest and Southfork Rivers. Between Cowley and Kipp, where it empties into the Belly River, the Oldman River is augmented by several creeks, its course being easterly and northerly. It drains the area bounded on the north by the parallel of latitude through $59^{\circ} 20'$; on the south by the parallel of latitude through $49^{\circ} 20'$; and on the west by the Great Divide, this area being estimated to contain about 2,235 square miles, with topography varying from mountains to rolling prairie.

The bed of the river is of rock and gravel and has a large fall, with consequent swift water interspersed with falls and rapids, but it changes to quicksand and mud after reaching the prairie region, where the current is more sluggish.

The flow of this river, draining as it does mountain ranges with peaks extending above the snow line, is subject to great changes, caused by melting snow and heavy summer rains in the mountains. Floods occur regularly during the latter part of May and the early part of June. From this time on the flow is normally steady, but gradually decreases until the minimum is reached during January and February.

The precipitation throughout the basin is quite large. Consequently, though the region is almost entirely under cultivation where practicable, there is little need of irrigation. Owing to the depth of the valley and its steep, rocky banks, irrigation from this river would be expensive, if not impossible, but there are many excellent power sites at its falls and rapids. Up to the present, however, no power has been developed on this river, but investigations with that end in view are being made.

SUMMIT CREEK AT CROWSNEST.

Location.—On the SE. $\frac{1}{4}$ Sec. 12, Tp. 8, Rge. 6, W. 5th Mer., about 1,000 feet upstream from the Canadian Pacific Railway Company's concrete dam.

Records available.—Discharge measurements only are available from February 21, 1912, to December 31, 1914.

Gauge.—Vertical staff, nailed to a tree on the right bank.

Bench-mark.—Spruce stump on the right bank, about 30 feet downstream from the gauge; elevation, 5.94 feet above the zero of the gauge.

Channel.—Fairly permanent, with a bed of fine gravel.

Discharge measurements.—Made by wading in high water, and by means of a 24-inch weir in low stages.

Winter flow.—Discharge measurements are continued throughout the winter.

Observer.—No gauge height records are obtained at this station.

DISCHARGE MEASUREMENTS of Summit Creek near Crowsnest, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Feb. 16.....	E. W. W. Hughes.....	5.5	1.13	0.24	1.65	0.27
Mar. 5.....	do.....	6.0	1.20	0.24	1.53	0.29
Mar. 23.....	F. R. Burfield.....	5.5	1.30	0.34	1.62	0.44
April 10.....	J. E. Caughey.....	6.5	1.96	0.49	1.70	0.97
April 25.....	do.....	10.5	6.05	1.42	2.08	8.60
May 14.....	do.....	10.0	11.20	1.61	2.35	18.40
June 16.....	do.....	7.0	2.70	1.08	1.87	2.90
June 24.....	do.....	7.0	2.50	0.78	1.79	1.95
July 9.....	do.....	6.0	1.80	0.59	.....	1.06
July 24.....	do.....	.....	.....	.....	.....	0.63a
Aug. 8.....	do.....	.....	.....	.....	.....	0.31a
Aug. 22.....	do.....	.....	.....	.....	.....	0.53a
Sept. 2.....	do.....	.....	.....	.....	.....	0.29a
Sept. 23.....	do.....	.....	.....	.....	1.65	0.82a
Oct. 8.....	do.....	.....	.....	.....	1.65	0.36a
Oct. 31.....	do.....	.....	.....	.....	1.70	0.71a
Nov. 16.....	do.....	.....	.....	.....	1.79	0.86a
Dec. 5.....	do.....	.....	.....	.....	1.74	0.53a
Dec. 29.....	do.....	.....	.....	.....	1.61	0.18a

a Weir measurements.

DISCHARGE MEASUREMENTS of Allison Creek near Sentinel, in 1914.

(SW. 11-8-5-5.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 20.....	F. R. Burfield.....	13.5	5.90	1.38	1.35	7.9
April 9.....	J. E. Caughey.....	14.5	7.00	1.26	1.12	8.8
April 24.....	do.....	14.5	8.00	1.40	1.52	11.2
June 15.....	do.....	15.5	13.08	2.94	2.05	38.4
July 9.....	do.....	16.0	11.40	2.36	1.70	27.0
Aug. 7.....	do.....	15.0	9.75	1.91	.....	18.6
Sept. 4.....	do.....	15.0	9.15	1.60	1.60	14.6
Sept. 22.....	do.....	14.0	8.70	1.95	1.65	16.9

CROWSNEST RIVER NEAR COLEMAN.

Location.—On SW. $\frac{1}{4}$ Sec. 12, Tp. 8, Rge. 5, W. 5th Mer., near Prudent Le Gal's house.*Records available.*—June 13, 1910, to December 31, 1914.*Gauge.*—Vertical staff; zero of gauge maintained at 92.12 feet during 1910-12; 92.73 feet during 1913-14.*Bench-mark.*—Permanent iron bench-mark located on left bank at the station; assumed elevation, 100.00 feet.*Channel.*—Composed of gravel, and slightly shifting.*Discharge measurements.*—Made from a wooden bridge during high water, and by wading during low stages at a point about one mile below the gauge.*Winter flow.*—Discharge measurements continued during the winter season.*Observer.*—Prudent Le Gal.

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DISCHARGE MEASUREMENTS of Crowsnest River near Coleman, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 19.....	R. Palmer	43.0	25.6	1.44	1.50	37
Feb. 7.....	do	42.0	28.2	1.39	2.28	39
Mar. 7.....	E. W. W. Hughes	32.0	25.8	1.21	1.50	31
Mar. 20.....	F. R. Burfield.....	35.0	27.2	1.41	1.51	38
April 8.....	J. E. Caughey.....	36.0	31.4	1.60	1.67	50
April 24.....	do	42.0	49.2	2.75	2.28	135
May 13.....	do	47.0	65.5	3.24	2.85	213
June 15.....	do	54.0	81.0	3.30	3.25	268
June 23.....	do	30.0	64.2	2.99	2.70	192
July 9.....	do	54.0	74.8	3.37	2.85	252
July 23.....	do	48.0	49.8	2.82	2.25	140
Aug. 7.....	do	27.0	44.7	2.15	2.09	96
Aug. 21.....	do	30.0	57.0	2.40	2.35	137
Sept. 4.....	do	36.0	35.7	2.29	1.85	82
Sept. 22.....	do	38.0	40.8	2.72	2.05	111
Oct. 7.....	do	36.0	38.7	2.42	2.00	94
Oct. 27.....	do	38.0	42.6	2.73	2.05	116
Nov. 14.....	do	36.0	40.2	2.30	1.95	93
Dec. 4.....	do	34.0	37.2	2.04	1.94	76
Dec. 28.....	do	29.0	28.9	1.81	2.24	52

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Coleman, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.69	58 ^a	1.93	33	1.55	30	1.52	36	3.04	243	3.39	292
2.....	1.65	56	1.87	31	1.63	31	1.60	46	3.25	272	3.47	303
3.....	1.63	55	1.99	32	1.66	32	1.63	50	3.45	300	3.62	324
4.....	1.57	53	2.12	34	1.61	31	1.67	55	3.70	335	3.71	336
5.....	1.59	54	2.20	35	1.61	31	1.72	62	3.70	335	3.49	306
6.....	1.60	55	2.25	37	1.63	31	1.67	55	3.70	335	3.28	276
7.....	1.69	55	2.28	39	1.53	31	1.67	55	3.60	321	3.08	248
8.....	1.64	53	2.33	40	1.53	34 ^b	1.67	55	3.64	327	3.06	245
9.....	1.64	53	2.18	40	1.53	37	1.67	55	3.64	327	2.80	209
10.....	2.09	50	2.09	39	1.55	40	1.70	59	2.81	210	2.77	205
11.....	2.09	46	2.06	39	1.56	41	1.75	66	2.91	224	2.81	210
12.....	2.01	43	2.02	39	1.51	34	1.77	68	2.80	209	2.79	208
13.....	1.54	40	1.76	35	1.66	54	1.85	78	2.85	216	3.85	356
14.....	1.54	39	1.65	32	1.68	56	1.90	85	2.98	234	3.50	307
15.....	1.54	38	1.65	32	1.65	52	1.92	88	3.03	241	3.25	272
16.....	1.57	37	1.60	31	1.63	50	1.95	92	3.13	255	3.29	278
17.....	1.49	36	1.60	31	1.60	46	2.00	98	3.19	264	3.26	273
18.....	1.49	36	1.59	30	1.63	50	2.00	98	3.25	272	3.25	272
19.....	2.07	37	1.50	30	1.63	50	2.00	98	3.30	279	3.25	272
20.....	2.50	37	1.45	28	1.54	38	2.15	118	3.40	293	3.16	259
21.....	2.59	38	1.45	28	1.59	45	2.15	118	3.98	374	3.07	247
22.....	2.59	38	1.49	29	1.59	45	2.20	125	3.66	329	2.92	226
23.....	1.70	38	1.55	30	1.62	49	2.25	132	3.54	313	2.70	192 ^c
24.....	1.73	38	1.55	30	1.79	71	2.28	136	3.54	313	2.80	210
25.....	2.13	37	1.57	30	1.81	73	2.28	136	3.42	296	3.05	245
26.....	2.20	33	1.54	30	1.77	68	2.28	136	3.29	278	3.15	261
27.....	2.09	30	1.55	30	1.68	56	2.28	136	3.97	373	3.10	256
28.....	1.80	30	1.55	30	1.58	43	3.00	237	3.26	273	2.95	238
29.....	2.20	33	.....	.....	1.52	36	3.00	237	3.12	254	2.95	240
30.....	2.19	37	.....	.....	1.55	40	3.00	237	3.25	272	3.05	256 ^d
31.....	2.02	35	.....	.....	1.55	40	.....	.....	3.07	247	.....	.....

a to b Ice conditions.
c to d Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Coleman, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.02	255c	2.21	121	1.85	80	2.00	98	1.95	100	2.50	84
2.....	3.02	258	2.21	120	1.85	80	2.00	98	2.00	107	2.55	80
3.....	3.00	257	2.18	114	1.85	81	1.95	90	1.98	103	1.75	77
4.....	3.05	266	2.14	107	1.85	82	2.10	111	2.00	105	1.94	76
5.....	3.05	268	2.10	101	1.85	82	2.10	110	2.10	119	1.49	74
6.....	2.95	257	2.06	94	1.85	82	2.05	101	2.00	105	1.50	71
7.....	2.90	253	2.09	96	1.85	83	2.00	94	1.98	101	2.13	69
8.....	2.90	255	2.02	88	1.90	89	2.04	101	1.95	97	2.52	67
9.....	2.85	252	2.00	85	1.87	87	2.04	101	1.95	96	2.85	64
10.....	2.80	244	1.95	78	1.72	65	2.00	97	1.95	96	2.85	60
11.....	2.77	237	1.95	78	1.65	56	2.00	97	1.95	95	2.65	58
12.....	2.75	232	1.95	79	1.65	56	2.15	117	2.00	102	2.34	56
13.....	2.75	230	1.95	80	1.65	56	2.32	142	2.00	101	2.05	54
14.....	2.75	228	1.95	80	1.65	56	2.43	158	1.95	93d	2.05	52
15.....	2.71	220	1.95	80	1.84	82	2.49	166	1.95	90a	2.12	52
16.....	2.66	211	1.91	75	1.83	82	2.52	171	2.45	91	2.35	52
17.....	2.62	203	2.25	122	1.85	84	2.60	182	2.40	92	2.60	52
18.....	2.57	195	2.66	178	1.82	80	2.53	175	2.30	94	2.65	53
19.....	2.55	190	2.66	179	1.82	80	2.70	197	2.15	95	2.68	53
20.....	2.53	185	2.55	164	2.01	105	2.62	188	1.98	97	2.70	53
21.....	2.50	179	2.35	137	1.99	102	2.44	165	1.85	98	2.74	54
22.....	2.50	176	2.35	138	2.05	111	2.31	147	1.85	99	2.71	53
23.....	2.25	140	2.26	127	1.98	100	2.28	144	1.85	100	2.70	53
24.....	2.25	138	2.24	125	2.00	103	2.25	141	1.85	100	2.68	52
25.....	2.25	137	2.22	123	2.05	109	2.10	121	1.85	100	2.52	52
26.....	2.25	136	2.21	123	2.09	114	2.10	122	1.85	100	2.52	52
27.....	2.25	134	2.21	123	2.15	122	2.05	116	1.85	98	2.50	52
28.....	2.25	133	2.11	111	2.09	113	2.10	122	1.85	96	2.24	52
29.....	2.30	138	2.02	100	2.03	104	2.05	115	1.85	93	2.41	52
30.....	2.26	131	1.85	77	2.00	99	2.00	108	1.85	89	2.30	52
31.....	2.25	128	1.85	79	.....	.....	1.93	98	.....	.....	2.05	53b

a to b Ice conditions.

c to d Shifting conditions.

MONTHLY DISCHARGE of Crowsnest River near Coleman, for 1914.

(Drainage area 70 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	58	30	42	0.600	0.69	2,582
February.....	40	28	33	0.471	0.49	1,833
March.....	73	30	44	0.629	0.72	2,705
April.....	237	36	102	1.460	1.63	6,069
May.....	374	209	284	4.010	4.62	17,464
June.....	356	192	261	3.730	4.16	15,531
July.....	268	128	202	2.880	3.32	12,420
August.....	179	75	109	1.560	1.80	6,702
September.....	122	56	88	1.260	1.41	5,236
October.....	197	90	129	1.840	2.12	9,732
November.....	119	89	98	1.400	1.56	5,831
December.....	84	52	59	0.843	0.97	3,628
The year.....	.....	.....	.....	.....	23.49	89,733

MCGILLIVRAY CREEK, NEAR COLEMAN.

Location.—On SE. $\frac{1}{4}$ Sec. 7, Tp. 8, Rge. 4, W. 5th Mer., about 150 feet north of C.P.Ry. Co.'s culvert across the creek.

Records available.—January 9, 1913, to October 31, 1914.

Gauge.—Vertical staff.

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Bench-mark.—Stump on left bank about 50 feet downstream from the gauge; elevation, 2.99 feet above zero of the gauge.

Channel.—Gravel, and slightly shifting.

Discharge measurements.—Made by wading during low stages, and from a foot bridge during high water.

Winter flow.—Discharge measurements are not made during the winter season.

Observer.—Mrs. H. G. Perdue.

DISCHARGE MEASUREMENTS of McGillivray Creek near Coleman, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 7.....	E. W. W. Hughes.....	13.0	5.02	0.38	0.95	1.90
Mar. 20.....	F. R. Burfield.....	15.5	5.76	0.47	0.95	2.70
April 8.....	J. E. Caughey.....	16.0	7.35	0.75	1.23	5.50
April 24.....	do.....	20.0	19.70	2.30	1.85	45.00
May 13.....	do.....	20.0	19.70	2.65	1.85	52.00
June 15.....	do.....	19.0	15.00	2.34	1.70	35.00
June 23.....	do.....	18.0	12.20	2.10	1.50	26.00
July 9.....	do.....	17.0	9.80	1.76	1.40	17.30
July 23.....	do.....	17.0	7.85	1.19	1.25	9.40
Aug. 7.....	do.....	10.0	5.80	1.26	1.18	7.30
Aug. 21.....	do.....	9.0	6.30	0.82	1.25	5.20
Sept. 4.....	do.....	9.0	5.50	0.73	1.20	4.00
Sept. 22.....	do.....	11.0	8.75	1.10	1.35	9.70
Oct. 7.....	do.....	10.0	7.50	0.87	1.30	6.60
Oct. 27.....	do.....	11.0	8.90	1.50	1.42	13.30

DAILY GAUGE HEIGHT AND DISCHARGE of McGillivray Creek near Coleman, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.04	63.0	1.82	46.0
2.....			2.05	64.0	1.91	53.0
3.....			2.11	69.0	1.96	57.0
4.....			1.91	53.0	1.95	56.0
5.....			1.78	42.0	1.82	46.0
6.....			1.71	37.0	1.75	40.0
7.....			1.65	32.0	1.64	32.0
8.....	1.23	8.9	1.76	41.0	1.65	32.0
9.....	1.23	8.9	2.00	60.0	1.61	30.0
10.....	1.21	8.2	2.00	60.0	1.55	26.0
11.....	1.25	9.6	1.85	48.0	1.55	26.0
12.....	1.41	16.8	1.82	46.0	1.64	32.0
13.....	1.48	21.0	1.83	46.0	1.64	32.0
14.....	1.55	26.0	1.88	50.0	1.65	32.0
15.....	1.62	30.0	2.02	62.0	1.65	32.0
16.....	1.71	37.0	2.08	66.0	1.68	35.0
17.....	1.72	38.0	2.04	63.0	1.68	35.0
18.....	1.61	30.0	2.05	64.0	1.68	35.0
19.....	1.89	51.0	2.01	61.0	1.64	32.0
20.....	1.98	58.0	1.88	50.0	1.63	31.0
21.....	1.82	46.0	1.83	46.0	1.50	22.0
22.....	1.81	45.0	1.82	46.0	1.50	22.0
23.....	1.94	55.0	1.81	45.0	1.51	23.0
24.....	1.85	48.0	1.86	49.0	1.46	19.7
25.....	1.75	40.0	1.91	53.0	1.50	22.0
26.....	1.72	38.0	1.83	46.0	1.46	19.7
27.....	1.66	33.0	1.85	48.0	1.55	26.0
28.....	1.65	32.0	1.71	37.0	1.55	26.0
29.....	1.61	30.0	1.65	32.0	1.55	26.0
30.....	1.64	32.0	1.65	32.0	1.54	25.0
31.....			1.82	46.0		

DAILY GAUGE HEIGHT AND DISCHARGE of McGillivray Creek near Coleman, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.52	23.0	1.20	7.8	1.23	4.6	1.26	5.6
2.....	1.50	22.0	1.18	7.2	1.23	4.6	1.26	5.6
3.....	1.50	22.0	1.18	7.2	1.23	4.6	1.28	6.3
4.....	1.50	22.0	1.18	7.2	1.21	3.9	1.28	6.3
5.....	1.47	20.0	1.18	7.2	1.21	3.9	1.28	6.3
6.....	1.46	19.7	1.18	7.2	1.21	3.9	1.30	7.0
7.....	1.44	18.5	1.18	7.2	1.21	3.9	1.30	7.0
8.....	1.42	17.4	1.18	7.2	1.21	3.9	1.32	8.0
9.....	1.40	16.2	1.17	7.0	1.21	3.9	1.32	8.0
10.....	1.38	15.2	1.17	7.0	1.18	3.2	1.32	8.0
11.....	1.38	15.2	1.17	7.0	1.18	3.2	1.32	8.0
12.....	1.35	13.8	1.17	7.0	1.18	3.2	1.35	9.5
13.....	1.35	13.8	1.15	6.4	1.18	3.2	1.35	9.5
14.....	1.33	12.8	1.15	6.4	1.18	3.2	1.54	21.0
15.....	1.35	13.8	1.15	6.4	1.26	5.6	1.66	29.0
16.....	1.33	12.8	1.15	6.4a	1.26	5.6	1.85	44.0
17.....	1.32	12.4	1.35	9.5	1.26	5.6	1.80	40.0
18.....	1.30	11.4	1.35	9.5	1.35	9.5	1.68	31.0
19.....	1.30	11.4	1.30	7.0	1.35	9.5	1.65	28.0
20.....	1.28	10.7	1.30	7.0	1.35	9.5	1.58	24.0
21.....	1.28	10.7	1.25	5.3	1.35	9.5	1.55	22.0
22.....	1.27	10.3	1.25	5.3	1.35	9.5	1.51	18.7
23.....	1.25	9.6	1.31	7.5	1.33	8.5	1.48	16.8
24.....	1.25	9.6	1.31	7.5	1.33	8.5	1.46	15.6
25.....	1.25	9.6	1.28	6.3	1.32	8.0	1.45	15.0
26.....	1.22	8.5	1.28	6.3	1.32	8.0	1.45	15.0
27.....	1.22	8.5	1.25	5.3	1.30	7.0	1.44	14.4
28.....	1.21	8.2	1.25	5.3	1.30	7.0	1.42	13.2
29.....	1.21	8.2	1.25	5.3	1.30	7.0	1.41	12.6
30.....	1.21	8.2	1.24	5.0	1.28	6.3	1.41	12.6
31.....	1.20	7.8	1.24	5.0	.....	.....	1.41	12.6b

a to b Changed conditions.

MONTHLY DISCHARGE of McGillivray Creek near Coleman, for 1914.

(Drainage area 16 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mil.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (8-30).....	58.0	8.2	32.0	2.00	1.71	1,460
May.....	69.0	32.0	50.0	3.12	3.58	3,074
June.....	57.0	19.7	32.0	2.00	2.23	1,904
July.....	23.0	7.8	13.6	0.85	0.98	842
August.....	9.5	5.0	6.7	0.42	0.48	412
September.....	9.5	3.2	5.9	0.37	0.41	363
October.....	44.0	5.6	15.5	0.97	1.12	953
The period.....	.....	.....	.....	.....	10.51	9,008

CROWSNEST RIVER, NEAR FRANK.

Location.—On the NE. $\frac{1}{4}$ Sec. 36, Tp. 7, Rge. 4, W. 5th Mer., at the traffic bridge.

Records available.—June 13, 1910, to December 31, 1914.

Gauge.—Vertical staff.

Bench-mark.—A stump on the left bank about 4 feet from the gauge; elevation, 9.43 feet above the zero of the gauge.

SESSIONAL PAPER No. 25c

Channel.—Gravel, and fairly permanent.

Discharge measurements.—Made from traffic bridge during high water, and by wading in low stages.

Observer.—I. Wilson.

DISCHARGE MEASUREMENTS of Crowsnest River near Frank, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 17.	R. Palmer.	52.0	49.8	1.36	3.91	68
Feb. 6.	do	51.0	35.6	1.36	3.97	50
Feb. 17.	E. W. W. Hughes.	50.0	33.7	1.31	4.04	44
Mar. 6.	do	49.5	38.6	1.17	3.95	45
Mar. 21.	F. R. Burfield.	49.5	42.3	1.21	4.05	51
April 9.	J. E. Caughey.	53.0	56.8	1.64	4.27	93
April 25.	do	67.0	113.0	3.40	5.20	384
May 12.	do	69.0	126.0	3.57	5.35	451
June 13.	do	66.0	107.3	3.38	5.15	363
June 22.	do	66.0	103.3	2.99	5.10	309
July 8.	do	67.0	96.6	3.19	5.00	301
July 22.	do	57.0	79.0	2.41	4.65	192
Aug. 6.	do	60.0	65.0	1.88	4.43	122
Aug. 20.	do	65.0	84.5	2.58	4.73	216
Sept. 3.	do	51.0	59.8	1.72	4.33	103
Sept. 21.	do	65.0	82.5	2.12	4.60	175
Oct. 6.	do	51.0	70.0	1.86	4.50	130
Oct. 26.	do	65.0	86.8	2.47	4.74	214
Nov. 12.	do	60.0	81.5	2.49	4.70	204
Dec. 4.	do	54.0	60.0	1.80	4.35	108
Dec. 28.	do	52.0	55.5	1.65	4.30	92

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Frank, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	4.00	49	4.01	50	4.01	50	4.05	56	5.25	402	5.25	402
2.	4.02	52	3.99	48	4.01	50	4.05	56	5.53	521	5.40	465
3.	4.05	56	3.99	48	4.01	50	4.05	56	5.75	616	5.60	551
4.	4.07	58	3.99	48	3.99	48	4.10	62	5.55	530	5.63	564
5.	4.17	74	3.97	46	3.97	46	4.25	89	5.35	444	5.55	530
6.	4.32	103	3.97	46	3.94	42	4.28	95	5.25	402	5.40	465
7.	4.40	121	3.96	45	3.94	42	4.25	89	5.15	362	5.25	402
8.	4.30	99	3.97	46	4.01	50	4.25	89	5.25	402	5.20	382
9.	4.32	103	3.97	46	4.03	53	4.27	93	5.50	508	5.10	343
10.	4.17	74	3.98	47	3.99	48	4.30	99	5.55	530	5.00	306
11.	4.17	74	4.01	50	3.96	45	4.35	110	5.40	465	5.00	306
12.	4.14	69	4.01	50	4.01	50	4.50	145	5.40	465	5.05	324
13.	4.15	70	4.01	50	4.06	57	4.70	201	5.43	478	5.15	362
14.	4.16	72	4.01	50	4.11	64	4.93	281	5.50	508	5.25	402
15.	4.16	72	4.01	50	4.09	61	5.10	343	5.65	572	5.23	394
16.	4.15	70	4.01	50	4.06	57	5.13	355	5.65	572	5.23	394
17.	4.16	72	4.02	52	4.06	57	5.05	324	5.65	572	5.25	402
18.	4.15	70	4.02	52	4.13	67	4.90	270	5.63	564	5.28	414
19.	4.12	65	4.01	50	4.11	64	5.35	444	5.60	551	5.25	402
20.	4.02	52	4.01	50	3.96	45	5.33	435	5.55	530	5.23	394
21.	3.97	46	4.01	50	4.01	50	5.10	343	5.45	486	5.17	370
22.	3.97	46	4.01	50	4.05	56	5.07	332	5.45	486	5.08	336
23.	3.97	46	4.01	50	4.05	56	5.10	343	5.45	486	4.97	295
24.	3.95	44	4.01	50	4.00	49	5.25	402	5.60	551	4.90	270
25.	3.97	46	4.01	50	3.95	44	5.18	374	5.55	530	5.20	382
26.	3.98	47	3.99	48	3.95	44	5.14	359	5.50	508	5.33	435
27.	4.00	49	3.98	47	4.00	49	5.10	343	5.35	444	5.22	390
28.	3.98	47	3.99	48	4.03	53	5.07	332	5.30	422	5.15	362
29.	3.98	47			4.05	56	5.00	306	5.20	382	5.15	362
30.	3.98	47			4.05	56	5.05	324	5.15	362	5.15	362
31.	4.00	49			4.05	56			5.15	362		

DAILY GAUGE HEIGHT AND DISCHARGE of Crowsnest River near Frank, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	5.10	343	4.45	133	4.36	112	4.45	133	4.65	186	4.52	150
2.....	5.08	336	4.44	131	4.35	110	4.45	133	4.70	201	4.52	150
3.....	5.08	336	4.43	128	4.33	106	4.50	145	4.73	211	4.47	138
4.....	5.10	343	4.43	128	4.33	106	4.54	155	4.70	201	4.42	126
5.....	5.13	355	4.42	126	4.32	103	4.54	155	4.72	208	4.40	121
6.....	5.08	336	4.41	123	4.32	103	4.52	150	4.75	218	4.38	117
7.....	5.00	306	4.40	121	4.31	101	4.50	145	4.73	211	4.30	99
8.....	4.95	288	4.40	121	4.30	99	4.49	143	4.70	201	4.25	89
9.....	4.95	288	4.38	117	4.30	99	4.52	150	4.67	192	4.22	83
10.....	4.93	281	4.36	112	4.28	95	4.55	158	4.65	186	4.19	77
11.....	4.90	270	4.35	110	4.27	93	4.55	158	4.68	195	4.14	60
12.....	4.90	270	4.35	110	4.25	89	4.55	158	4.66	189	4.17	74
13.....	4.93	281	4.34	108	4.25	89	4.70	201	4.63	180	4.23	85
14.....	4.90	270	4.32	103	4.20	79	4.85	252	4.60	171	4.25	89
15.....	4.85	252	4.30	99	4.33	106	5.05	324	4.35	110	4.25	89
16.....	4.80	235	4.30	99	4.35	110	5.20	382	4.32	103	4.23	85
17.....	4.75	218	4.65	186	4.34	108	5.25	402	4.30	99	4.22	83
18.....	4.70	201	4.80	235	4.40	121	5.15	362	4.35	110	4.22	83
19.....	4.67	192	4.77	225	4.60	171	5.10	343	4.40	121	4.24	87
20.....	4.65	186	4.70	201	4.62	177	5.05	324	4.53	153	4.24	87
21.....	4.65	186	4.60	171	4.58	166	4.95	288	4.55	158	4.25	89
22.....	4.60	171	4.53	153	4.55	158	4.90	270	4.55	158	4.27	93
23.....	4.65	186	4.65	186	4.52	153	4.85	252	4.55	158	4.27	93
24.....	4.55	158	4.60	171	4.53	153	4.82	242	4.57	163	4.28	95
25.....	4.53	153	4.55	158	4.53	153	4.75	218	4.60	171	4.29	97
26.....	4.52	150	4.50	145	4.54	155	4.72	208	4.63	180	4.29	97
27.....	4.52	150	4.47	138	4.55	158	4.70	201	4.63	180	4.30	99
28.....	4.50	145	4.45	133	4.54	155	4.68	195	4.60	171	4.30	99
29.....	4.50	145	4.43	128	4.50	145	4.65	186	4.57	163	4.30	99
30.....	4.48	140	4.40	121	4.47	138	4.65	186	4.52	150	4.30	99
31.....	4.46	135	4.38	117	.....	.....	4.63	180	.....	.....	4.29	97

MONTHLY DISCHARGE of Crowsnest River near Frank, for 1914.

(Drainage area 168 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	121	44	64	0.382	0.44	3,948
February.....	52	45	49	0.290	0.30	2,710
March.....	67	42	52	0.310	0.36	3,204
April.....	444	56	238	1.420	1.58	14,180
May.....	616	362	484	2.880	3.32	29,778
June.....	564	270	392	2.340	2.61	23,344
July.....	343	135	236	1.400	1.61	14,511
August.....	235	99	140	0.833	0.96	8,608
September.....	177	79	124	0.738	0.82	7,379
October.....	402	133	219	1.300	1.50	13,466
November.....	218	99	170	1.010	1.13	10,116
December.....	150	69	98	0.583	0.67	6,026
The year.....	.....	.....	.....	.....	15.30	137,270



Gauging Station on Crowsnest River near Frank, Alberta. Taken by G. H. Whyte.



Gauging Station on Crowsnest at Lundbreck, Alberta. Taken by G. H. Whyte.

SESSIONAL PAPER No. 25c

CROWSNEST RIVER NEAR LUNDBRECK.

Location.—On the NE. $\frac{1}{4}$ Sec. 26, Tp. 7, Rge. 2, W. 5th Mer., at the traffic bridge just north of Lundbreck.

Records available.—September 7, 1907, to December 31, 1914.

Gauge.—Chain on downstream side of the traffic bridge about 75 feet upstream from the old staff gauge; elevation of zero of staff gauge maintained at 91.82 feet during 1912-13; 90.86 feet during 1914.

Bench-mark.—Permanent bench-mark cut in the left wing-wall on the downstream side; assumed elevation, 100.00 feet.

Channel.—Rocky formation and fairly permanent.

Discharge measurements.—Made from the traffic bridge during high water, and by wading in low stages.

Winter flow.—Discharge measurements are continued during the winter season.

Observer.—Ed. Marlow.

DISCHARGE MEASUREMENTS of Crowsnest River near Lundbreck, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 19.....	R. Palmer.....	54.0	67.0	1.12	2.40	75
Jan. 30.....	do.....	50.0	77.0	0.97	2.95	75
Feb. 18.....	E. W. W. Hughes.....	65.0	65.5	0.99	3.01	65
Mar. 10.....	F. R. Burfield.....	55.0	69.2	1.01	2.66	70
Mar. 26.....	do.....	60.0	133.0	0.90	2.78	121
April 11.....	J. E. Caughey.....	55.0	82.5	1.82	2.03	150
April 27.....	do.....	65.0	134.0	3.33	3.02	447
May 19.....	do.....	68.0	171.0	4.31	3.45	738
June 6.....	do.....	66.0	146.6	3.90	3.26	571
June 26.....	do.....	66.0	155.9	3.61	3.20	562
July 13.....	do.....	62.0	107.8	2.65	2.50	285
July 28.....	do.....	57.0	90.8	2.02	2.20	183
Aug. 13.....	do.....	55.0	84.0	1.75	1.90	147
Aug. 24.....	do.....	60.0	106.0	2.42	2.39	256
Sept. 12.....	do.....	55.0	80.5	1.68	1.87	135
Sept. 25.....	do.....	57.0	97.9	2.20	2.12	215
Oct. 14.....	do.....	60.0	117.0	2.74	2.52	321
Nov. 3.....	do.....	60.0	108.0	2.72	2.45	294
Nov. 19.....	do.....	55.0	92.0	2.00	2.30	184
Dec. 10.....	do.....	55.0	89.5	1.19	2.30	107
Dec. 30.....	do.....	68.0	96.0	1.52	3.16	146

DAILY GAUGE HEIGHT AND DISCHARGE OF Crowsnest River near Lundbreck, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.81	95a	2.96	76	2.96	71	1.82	126	3.15	528	3.00	460
2.....	2.76	96	2.86	74	2.96	71	1.82	126	3.30	600	3.05	482
3.....	2.74	97	2.86	72	2.96	70	1.77	119	3.75	855	3.32	610
4.....	2.71	97	2.76	70	2.96	70	1.84	129	3.55	735	3.31	605
5.....	2.76	98	2.71	70	2.76	69	1.95	146	3.45	678	3.28	590
6.....	2.76	98	2.76	74	2.71	69	2.09	172	3.10	505	3.18	541
7.....	2.80	97	2.86	75	2.76	69	2.03	161	3.10	505	3.00	460
8.....	2.79	96	2.96	75	2.91	70	1.97	150	3.10	505	2.80	375
9.....	2.66	94	2.86	75	2.91	70	1.99	153	3.35	625	2.81	379
10.....	2.60	92	2.86	75	2.66	70	2.01	157	3.45	678	2.75	357
11.....	2.61	92	2.91	76	2.61	71	2.03	161	2.40	244	2.70	339
12.....	2.56	92	2.91	78	2.71	74	2.28	212	3.35	625	2.70	339
13.....	2.66	90	2.86	78	1.66	76	2.54	286	3.30	600	2.85	395
14.....	2.46	88	2.91	76	1.61	78	2.79	371	3.35	625	2.95	438
15.....	2.61	84	2.88	74	1.60	84	2.79	371	3.40	650	2.96	442
16.....	2.41	82	2.86	71	1.51	90	3.09	500	3.40	650	3.00	460
17.....	2.41	80	2.81	66	1.51	95	3.04	478	3.35	625	3.02	469
18.....	2.66	78	3.01	65	1.57	99	2.80	375	3.50	705	3.00	460
19.....	2.76	75	2.81	65	1.52	104	2.75	357	3.40	650	3.00	460
20.....	2.86	75	2.76	66	1.52	110	3.35	625	3.40	650	2.95	438
21.....	2.96	75	2.88	70	1.52	113	3.00	460	3.40	650	2.88	407
22.....	3.11	74	2.76	72	1.47	115	2.95	438	3.20	550	2.80	375
23.....	2.96	74	2.96	73	1.52	117	3.00	460	3.20	550	2.70	339
24.....	2.82	73	2.96	74	1.52	119	3.30	600	3.40	650	2.68	332
25.....	2.96	72	3.01	74	1.57	120	3.10	505	3.40	650	2.80	375
26.....	3.01	72	2.91	73	2.77	121	3.10	505	3.30	600	3.15	528
27.....	3.06	72	2.96	72	2.52	121	3.05	482	3.23	565	3.00	460
28.....	3.01	72	2.94	71	2.17	118	3.00	460	3.05	482	2.90	415
29.....	2.86	73	.....	.....	2.07	110	2.95	438	3.00	460	2.90	415
30.....	3.01	75	.....	.....	1.87	104	3.00	460	2.90	415	2.85	395
31.....	2.96	76	.....	.....	1.57	98b	.....	.....	3.00	460	.....	.....

a to b Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE OF Crowsnest River near Lundbreck, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.85	395	2.10	174	2.00	155	2.10	210	2.35	270	2.40	154
2.....	2.80	375	2.11	176	2.00	155	2.07	204	2.35	270	2.35	149
3.....	2.78	368	2.10	174	1.95	146	2.07	204	2.45	300	2.25	143
4.....	2.78	368	2.06	166	1.93	143	2.10	210	2.40	284	2.25	138
5.....	2.76	361	2.06	166	1.91	140	2.18	228	2.50	315	2.25	130
6.....	2.76	361	2.05	164	1.90	138	2.10	210	2.48	309	2.28	125
7.....	2.74	353	2.05	164	1.90	138	2.10	210	2.40	284	2.30	120
8.....	2.65	322	2.05	164	1.94	145	2.12	214	2.35	270	2.26	114
9.....	2.65	322	2.05	164	1.90	138	2.15	221	2.36	273	2.16	108
10.....	2.60	305	2.04	163	1.88	135	2.20	232	2.30	257	2.20	107
11.....	2.55	290	2.00	155	1.85	130	2.20	232	2.30	257	2.45	106
12.....	2.52	280	2.00	155	1.87	134	2.20	232	2.30	257	2.85	106
13.....	2.50	274	1.90	138	1.85	130	2.28	252	2.30	257	3.45	106
14.....	2.50	274	1.86	132	1.85	130	2.52	322	2.25	244	4.05	106
15.....	2.51	277	1.85	130	1.90	138	2.90	465	2.05	200	4.00	107
16.....	2.48	268	1.85	130	1.90	138	3.05	530	2.05	200	4.00	107
17.....	2.45	259	2.10	174	1.90	140	3.15	580	2.10	180 ^a	3.95	108
18.....	2.40	244	2.40	244	2.00	164	2.95	485	2.25	182	3.85	109
19.....	2.40	244	2.40	244	2.16	202	2.90	465	2.26	184	3.70	111
20.....	2.36	233	2.35	230	2.20	215	2.80	425	2.20	186	3.65	112
21.....	2.35	230	2.25	206	2.20	220	2.80	425	2.35	187	3.50	114
22.....	2.30	217	2.18	190	2.15	212	2.70	385	2.30	187	3.50	117
23.....	2.28	212	2.26	208	2.10	204	2.55	332	2.30	187	3.40	120
24.....	2.24	203	2.40	244	2.10	207	2.53	326	2.33	186	3.20	124
25.....	2.24	203	2.30	217	2.12	215 ^d	2.45	300	2.38	183	3.30	128
26.....	2.26	208	2.15	184	2.15	221	2.47	306	2.40	178	3.28	134
27.....	2.26	208	2.12	178	2.10	210	2.45	300	2.38	169	3.25	138
28.....	2.20	194	2.10	174	2.10	210	2.40	284	2.40	164	3.20	141
29.....	2.18	190	2.05	164	2.10	210	2.40	284	2.36	161	3.23	144
30.....	2.15	184	2.05	164	2.05	200	2.35	270	2.25	158	3.27	146
31.....	2.15	184	2.00	155			2.35	270			3.25	147 ^b

a to b Ice conditions.
c to d Shifting conditions.

MONTHLY DISCHARGE of Crowsnest River near Lundbreck, for 1914.

(Drainage area 276 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	98	72	84	0.30	0.35	5,165
February.....	78	65	72	0.26	0.27	3,999
March.....	121	69	91	0.33	0.38	5,595
April.....	625	119	333	1.21	1.35	19,815
May.....	855	244	589	2.13	2.46	36,216
June.....	610	332	438	1.59	1.77	26,063
July.....	395	184	271	0.98	1.13	16,663
August.....	244	130	177	0.64	0.74	10,883
September.....	221	130	169	0.61	0.68	10,056
October.....	580	204	310	1.12	1.29	19,061
November.....	315	158	225	0.82	0.91	13,388
December.....	154	106	123	0.44	0.51	7,563
The year.....					11.84	174,467

CONNELLY CREEK NEAR LUNDBRECK.

Location.—On SE. $\frac{1}{4}$ Sec. 36, Tp. 7, Rge. 2, W. 5th Mer., on the north side of Crowsnest River, about half way between Lundbreck and Cowley.

Records.—Discharge measurements only are available from August 20, 1908, to December 31, 1914.

Gauge.—Vertical staff, nailed to a tree on the left bank.

Bench-mark.—The head of a bolt driven vertically in a notch cut in a leaning tree, on the left bank; elevation, 3.93 feet above the zero of the gauge.

Discharge measurements.—Made by wading in high water, and by means of an 18-inch weir in low stages.

Winter flow.—Discharge measurements are not made during the winter season.

Observer.—Gauge height records are available from August 1, 1909, to October 31, 1909; since then there has been no observer at this station.

DISCHARGE MEASUREMENTS of Connelly Creek near Lundbreck, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 26.....	F. R. Burfield.....	4.0	3.43	0.41	.....	1.40
April 11.....	J. E. Caughey.....	11.5	8.11	1.14	2.57	9.20
April 27.....	do.....	11.5	6.07	0.72	.....	4.40
May 19.....	do.....	11.0	6.37	0.84	.....	5.30
June 6.....	do.....	11.5	5.90	0.60	.....	3.60
June 23.....	do.....	12.5	9.42	1.97	.....	18.60
July 13.....	do.....	11.0	5.05	0.38	4.35	1.92
July 28.....	do.....	5.0	1.40	0.34	.....	0.48
Aug. 13.....	do.....	.....	.....	.....	.....	0.76 ^a
Aug. 24.....	do.....	11.5	7.15	0.94	2.45	0.67
Sept. 12.....	do.....	.....	.....	.....	2.20	0.65 ^a
Sept. 25.....	do.....	.....	.....	.....	2.30	0.36 ^a
Oct. 14.....	do.....	12.0	7.70	1.27	2.46	9.80
Nov. 3.....	do.....	10.0	5.10	0.55	2.34	2.80

^a Weir measurements.

COW CREEK NEAR COWLEY.

Location.—On NE. $\frac{1}{4}$ Sec. 14, Tp. 8, Rge. 2, W. 5th Mer., at John Ross' ranch, five miles north of Lundbreck station.

Records available.—August 20, 1908, to December 31, 1914.

Gauge.—Vertical staff; zero elevation maintained at 94.53 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Clay and rocks, fairly permanent.

Discharge measurements.—Made from a foot bridge during high water, and by wading in low stages.

Winter flow.—Discharge measurements are not made during the winter season.

Observer.—Wm. Mackay.

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DISCHARGE MEASUREMENTS of Cow Creek near Cowley, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 27.....	F. R. Burfield.	8.5	14.0	0.37	3.06	5.20
April 11.....	J. E. Caughey	8.0	11.0	1.89	2.52	21.00
April 27.....	do	8.5	9.1	0.98	2.14	9.00
May 19.....	do	8.7	11.6	1.33	2.35	15.50
June 6.....	do	8.5	10.5	1.10	2.22	11.50
June 26.....	do	8.0	13.0	1.72	2.54	22.00
July 13.....	do	8.0	6.7	0.72	1.89	4.80
July 28.....	do	8.5	5.8	0.44	1.74	2.60
Aug. 13.....	do	8.0	5.0	0.36	1.68	1.78
Aug. 24.....	do	8.5	7.0	0.59	1.85	4.10
Sept. 12.....	do	8.5	4.8	0.34	1.69	1.60
Sept. 25.....	do	5.5	1.9	0.74	1.67	1.43
Oct. 14.....	do	7.0	6.9	1.44	2.15	9.90
Nov. 3.....	do	6.0	4.0	0.82	1.86	3.20

DAILY GAUGE HEIGHT AND DISCHARGE of Cow Creek near Cowley, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.27	12.7	2.23	11.5	2.16	9.7
2.....			2.71	13.0	2.19	10.5	2.15	9.5
3.....			2.71	13.0	2.20	10.7	2.14	9.3
4.....			2.74	18.0	2.30	13.5	2.14	9.3
5.....			3.60	14.0	2.30	13.5	2.18	10.2
6.....			3.31	16.0	2.27	12.7	2.22	11.3
7.....			2.82	18.0	2.25	12.1	2.19	10.5
8.....			2.72	20.0	2.23	11.5	2.12	8.8
9.....			2.65	23.0	2.30	13.5	2.09	8.1
10.....			2.62	24.8b	2.27	12.7	2.09	8.1
11.....			2.44	18.0	2.31	13.8	2.08	7.9
12.....			3.10	45.0	2.29	13.2	2.08	7.9
13.....			2.80	32.0	2.35	15.1	2.29	13.2
14.....			2.50	20.0	2.30	13.5	2.15	9.5
15.....	3.40	2.00a	2.43	17.7	2.29	13.2	2.11	8.5
16.....	3.10	2.30	2.38	16.1	2.30	13.5	2.08	7.9
17.....	2.91	2.60	2.24	11.8	2.30	13.5	2.06	7.5
18.....	3.00	2.80	2.13	9.0	2.30	13.5	1.99	6.0
19.....	2.98	3.00	2.30	13.5	2.35	15.1	1.98	5.8
20.....	2.95	3.30	2.95	38.0	2.40	16.7	1.97	5.7
21.....	3.39	3.70	2.30	13.5	2.36	15.4	1.96	5.5
22.....	2.60	4.00	2.29	13.2	2.35	15.1	1.94	5.1
23.....	2.68	4.20	2.24	11.8	2.34	14.8	1.94	5.1
24.....	3.19	4.50	2.21	11.0	2.30	13.5	1.95	5.3
25.....	2.70	4.80	2.18	10.2	2.28	12.9	2.61	24.0
26.....	3.50	5.00	2.15	9.5	2.27	12.7	2.89	36.0
27.....	2.94	5.20	2.14	9.3	2.26	12.4	2.17	10.0
28.....	2.51	7.00	2.26	12.4	2.29	13.2	2.09	8.1
29.....	2.48	9.00	2.35	15.1	2.25	12.1	2.14	9.3
30.....	2.31	11.00	2.29	13.2	2.20	10.7	2.12	8.8
31.....	2.29	13.20			2.22	11.3		

a to b Discharge estimated—ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE OF COW CREEK near Cowley, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1...	2.09	8.1	1.71	1.83	1.68	1.52	1.68	1.52
2...	2.06	7.5	1.69	1.61	1.68	1.52	1.69	1.61
3...	2.00	6.2	1.69	1.61	1.67	1.43	1.69	1.61
4...	1.99	6.0	1.66	1.34	1.66	1.34	1.75	2.40
5...	2.09	8.1	1.65	1.25	1.68	1.52	1.87	4.00
6...	2.05	7.2	1.64	1.16	1.68	1.52	1.90	4.40
7...	1.99	6.0	1.64	1.16	1.66	1.34	1.70	1.70
8...	1.97	5.7	1.67	1.43	1.71	1.83	1.90	4.40
9...	1.95	5.3	1.69	1.61	1.70	1.70	1.87	4.00
10...	1.94	5.1	1.73	2.10	1.69	1.61	1.87	4.00
11...	1.93	4.9	1.69	1.61	1.69	1.61	1.81	3.10
12...	1.91	4.6	1.69	1.61	1.70	1.70	2.01	6.40
13...	1.90	4.4	1.69	1.61	1.70	1.70	2.19	10.50
14...	1.90	4.4	1.66	1.84	1.70	1.70	2.19	10.50
15...	1.90	4.4	1.62	0.98	1.73	2.10	1.90	4.40
16...	1.89	4.3	1.60	0.80	1.75	2.40	1.88	4.10
17...	1.87	4.0	1.70	1.70	1.81	3.10	1.86	3.80
18...	1.83	3.4	1.91	4.60	1.81	3.10	1.84	3.60
19...	1.79	2.9	1.79	2.90	1.75	2.40	1.82	3.30
20...	1.79	2.9	1.69	1.61	1.78	2.70	1.82	3.30
21...	1.79	2.9	1.69	1.61	1.71	1.83	1.81	3.10
22...	1.78	2.7	1.68	1.52	1.71	1.83	1.82	3.30
23...	1.78	2.7	1.94	5.10	1.68	1.52	1.82	3.30
24...	1.78	2.7	1.94	5.10	1.68	1.52	1.85	3.70
25...	1.76	2.5	1.79	2.90	1.68	1.52	1.82	3.30
26...	1.76	2.5	1.70	1.70	1.67	1.43	1.82	3.30
27...	1.75	2.4	1.69	1.61	1.67	1.43	1.83	3.40
28...	1.74	2.2	1.68	1.52	1.68	1.52	1.84	3.60
29...	1.74	2.2	1.68	1.52	1.68	1.52	1.84	3.60
30...	1.74	2.2	1.65	1.25	1.68	1.52	1.83	3.40
31...	1.74	2.2	1.67	1.43			1.84	3.60

MONTHLY DISCHARGE of Cow Creek near Cowley, for 1914.

(Drainage area 29 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March 15-31	13.2	2.09	5.29	0.179	0.113	175
April	45.0	9.00	17.10	0.589	0.657	1,018
May	16.7	10.50	13.10	0.452	0.521	806
June	36.0	5.10	9.70	0.334	0.373	577
July	8.1	2.29	4.30	0.148	0.171	254
August	5.1	0.80	1.91	0.096	0.076	117
September	3.1	1.34	1.78	0.061	0.068	106
October	10.5	1.52	3.90	0.136	0.157	240
The period					2.136	3,303

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ELTON DITCH FROM TODD CREEK.

Location.—On SW. $\frac{1}{4}$ Sec. 19, Tp. 8, Rge. 1, W. 5th Mer., on Elton's ranch, seven miles north of Cowley.

Records available.—June 6, 1914, to September 25, 1914.

Gauge.—Vertical staff.

Bench-mark.—Two spikes in a post 150 feet south of the gauge; elevation, 1.66 feet above the zero of the gauge.

Channel.—Clay, and fairly permanent.

Discharge measurements.—Made by wading.

Observer.—Cecil Elton.

DISCHARGE MEASUREMENTS of Elton Ditch from Todd Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 6.....	J. E. Caughey.....	2.5	1.28	0.55	2.24	0.71
June 26.....	do	3.0	2.19	0.55	2.40	1.20
Sept. 25.....	do			^a	2.02	0.04

^a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Elton Ditch from Todd Creek, for 1914.

DAY.	May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.30	0.89
2.....			2.30	0.89
3.....			2.29	0.86
4.....			2.31	0.92
5.....			2.32	0.95
6.....			2.34	1.01
7.....			2.34	1.01
8.....			2.34	1.01
9.....			2.32	0.95
10.....			2.32	0.95
11.....			2.32	0.95
12.....			2.31	0.92
13.....			2.32	0.95
14.....	2.25	0.74	2.32	0.95
15.....	2.25	0.74	2.32	0.95
16.....	2.24	0.71	2.31	0.92
17.....	2.24	0.71	2.31	0.92
18.....	2.24	0.71	2.31	0.92
19.....	2.25	0.74	2.30	0.89
20.....	2.28	0.83	2.30	0.89
21.....	2.29	0.86	2.29	0.86
22.....	2.29	0.86	2.29	0.86
23.....	2.30	0.89	2.29	0.86
24.....	2.30 ^a	0.89	2.28	0.83
25.....	2.30 ^a	0.89	2.33	0.98
26.....	2.30	0.89	2.37	1.10
27.....	2.34	1.01	.....	.....
28.....	2.34	1.01	2.32	0.95
29.....	2.31	0.92	2.33	0.98
30.....	2.32	0.95	.....	.....
31.....	2.31	0.92	.....	.....

^a Gauge height interpolated.

MONTHLY DISCHARGE of Elton Ditch from Todd Creek, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (14-31).....	1.01	0.71	0.843	.....	.....	30
June (1-29).....	1.10	0.83	0.933	.....	.....	52
The period.....	.....	.....	.....	.....	.....	82

TODD CREEK AT ELTON'S RANCH.

Location.—On SW. $\frac{1}{4}$ Sec. 19, Tp. 8, Rge. 1, W. 5th Mer., near Cecil Elton's house, seven miles north of Cowley.

Records available.—August 20, 1908, to December 31, 1914.

Gaugc.—Vertical staff; elevation of zero maintained at 93.30 feet during 1909-1911; 93.02 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Sand and gravel, and quite permanent.

Discharge measurements.—These are made from a foot bridge during high water, and by wading during low stages.

Winter flow.—No discharge measurements are made during the winter season.

Observer.—Cecil Elton.

DISCHARGE MEASUREMENTS of Todd Creek at Elton's Ranch, in 1914.

Date.		Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
March	27	F. R. Burfield.....	6.5	6.60	1.02	4.47	6.70
April	11	J. E. Caughey.....	18.0	23.10	1.41	3.95	33.00
April	27	do.....	18.0	15.10	1.20	2.91	18.20
May	19	do.....	18.3	17.00	1.39	2.98	24.00
June	6	do.....	18.0	17.50	1.44	3.01	25.00
June	26	do.....	19.0	35.40	1.80	3.50	64.00
July	3	do.....	18.0	12.15	0.92	2.75	11.50
July	28	do.....	18.0	8.60	0.70	2.64	6.00
Aug.	13	do.....	18.0	8.00	0.61	2.60	4.90
Aug.	24	do.....	17.5	15.05	1.02	2.86	15.40
Sept.	12	do.....	18.0	9.70	0.60	2.64	6.00
Sept.	25	do.....	18.0	9.50	0.62	2.64	5.90
Oct.	14	do.....	18.0	13.80	1.14	2.85	15.80
Nov.	3	do.....	18.0	10.60	0.87	2.72	9.30

DAILY GAUGE HEIGHT AND DISCHARGE of Todd Creek at Elton's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.98	16.5	2.98	23.0	2.93	20.0
2.....			3.98	18.0	2.94	20.0	2.93	20.0
3.....			4.13	19.5	2.96	22.0	2.90	18.0
4.....			4.28	20.0	3.03	26.0	2.93	20.0
5.....			5.06	23.0	3.01	25.0	2.99	23.0
6.....			5.18	25.0	3.00	24.0	3.01	25.0
7.....			4.85	27.0	2.94	20.0	2.98	23.0
8.....			4.27	28.5	2.94	20.0	2.95	21.0
9.....			4.08	30.0	3.00	24.0	2.92	19.2
10.....			4.08	31.0	2.98	23.0	2.91	18.6
11.....			3.88	33.0	3.01	25.0	2.91	18.6
12.....			3.86	36.5	2.98	23.0	2.90	18.0
13.....			3.95	40.0	3.00	24.0	2.92	19.2
14.....			3.43	44.0	2.99	23.0	2.94	20.0
15.....			3.34	47.0	2.96	22.0	2.89	17.4
16.....	4.29	2.02	3.34	50.0b	2.94	20.0	2.87	16.5
17.....	4.17	2.6	3.13	33.0	2.94	20.0	2.84	14.7
18.....	4.00	3.2	3.04	27.0	2.96	22.0	2.84	14.7
19.....	3.97	3.7	3.00	24.0	2.98	23.0	2.81	13.0
20.....	3.93	3.9	3.30	46.0	3.02	25.0	2.78	11.6
21.....	3.88	4.4	3.04	27.0	3.05	27.0	2.77	11.2
22.....	4.00	5.0	3.12	32.0	3.02	25.0	2.78	11.6
23.....	3.88	5.4	3.06	28.0	3.00	24.0	2.77	11.2
24.....	3.99	5.8	3.04	27.0	3.00	24.0	2.76	10.7
25.....	4.17	6.1	3.00	24.0	3.02	25.0	2.98	23.0
26.....	4.28	6.4	2.94	20.0	3.00	24.0	3.45	60.0
27.....	4.46	6.7	2.92	19.2	3.00	24.0	3.20	38.0
28.....	4.53	8.8	2.94	20.0	3.00	24.0	3.00	24.0
29.....	4.15	10.9	3.07	29.0	2.99	23.0	2.94	20.0
30.....	4.10	13.0	3.00	24.0	2.97	22.0	2.91	18.6
31.....	4.08	15.5			2.94	20.0		

a to b Discharge estimated—ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE OF Todd Creek at Elton's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.88	16.9	2.58	4.5	2.60	5.0	2.60	5.0
2.....	2.86	15.8	2.55	3.7	2.59	4.8	2.62	5.6
3.....	2.86	15.8	2.56	4.0	2.60	5.0	2.64	6.2
4.....	2.85	15.2	2.56	4.0	2.60	5.0	2.70	8.0
5.....	2.89	17.4	2.55	3.7	2.59	4.8	2.70	8.0
6.....	2.86	15.8	2.57	4.3	2.59	4.8	2.71	8.4
7.....	2.84	14.7	2.57	4.3	2.60	5.0	2.70	8.0
8.....	2.81	13.0	2.57	4.3	2.64	6.2	2.69	7.7
9.....	2.80	12.5	2.59	4.8	2.64	6.2	2.72	8.9
10.....	2.78	11.6	2.65	6.5	2.64	6.2	2.73	9.4
11.....	2.79	12.0	2.58	4.5	2.63	5.9	2.74	9.8
12.....	2.79	12.0	2.58	4.5	2.64	6.2	2.74	9.8
13.....	2.79	12.0	2.59	4.8	2.63	5.9	2.74	9.8
14.....	2.73	9.4	2.56	4.0	2.62	5.6	2.83	14.2
15.....	2.72	8.9	2.55	3.7	2.62	5.6	2.96	22.0
16.....	2.72	8.9	2.54	3.5	2.64	6.2	2.91	18.6
17.....	2.70	8.0	2.61	5.3	2.67	7.1	2.85	15.2
18.....	2.72	8.9	2.79	12.0	2.70	8.0	2.76	10.7
19.....	2.70	8.0	2.76	10.7	2.67	7.1	2.74	9.8
20.....	2.68	7.4	2.69	7.7	2.66	6.8	2.73	9.4
21.....	2.68	7.4	2.69	7.7	2.64	6.2	2.73	9.4
22.....	2.67	7.1	2.67	7.1	2.64	6.2	2.72	8.9
23.....	2.65	6.5	2.72	8.9	2.64	6.2	2.70	8.0
24.....	2.64	6.2	2.81	13.0	2.63	5.9	2.71	8.4
25.....	2.64	6.2	2.73	9.4	2.62	5.6	2.71	8.4
26.....	2.63	5.9	2.69	7.7	2.62	5.6	2.70	8.0
27.....	2.62	5.6	2.66	6.8	2.58	4.5	2.70	8.0
28.....	2.64	6.2	2.64	6.2	2.58	4.5	2.72	8.9
29.....	2.62	5.6	2.63	5.9	2.60	5.0	2.72	8.9
30.....	2.61	5.3	2.64	6.2	2.60	5.0	2.71	8.4
31.....	2.58	4.5	2.62	5.6			2.70	8.0

MONTHLY DISCHARGE OF Todd Creek at Elton's Ranch, for 1914.

(Drainage area 57 square miles).

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (16-31).....	15.5	2.0	6.5	0.114	0.068	206
April.....	50.0	16.5	26.0	0.508	0.568	1,726
May.....	27.0	20.0	23.0	0.404	0.466	1,414
June.....	38.0	10.7	20.0	0.351	0.392	1,190
July.....	17.4	4.5	10.0	0.175	0.202	615
August.....	13.0	3.5	6.1	0.107	0.123	375
September.....	8.0	4.5	5.7	0.100	0.111	339
October.....	22.0	5.0	9.6	0.168	0.187	590
The period.....					2.12	6,455

OLDMAN RIVER NEAR COWLEY.

Location.—On the NE. $\frac{1}{4}$ Sec. 34, Tp. 7, Rge. 1, W. 5th Mer.*Records available.*—June 17, 1908, to December 31, 1914; one discharge measurement in 1907.*Gauge.*—Vertical staff; elevation of zero maintained at 92.08 feet since establishment.*Bench-mark.*—Permanent iron bench-mark on right bank; assumed elevation, 100.09 feet.*Channel.*—Rock and gravel.*Discharge measurements.*—Made by means of cable and ear; at low water by wading.*Observer.*—Archie McKay.

DISCHARGE MEASUREMENTS of Oldman River near Cowley, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 15.	R. Palmer.	80	95 0	1 290	2 18	123
Jan. 31.	do	90	78 0	1.100	2 28	86
Feb. 19.	E. W. W. Hughes	83	83 6	1.130	2 41	95
March 11.	F. R. Burfield	174	105.0	0.807	1 75	85
March 27.	do	135	108.0	1.090	1.62	118
April 14.	J. E. Caughey.	180	220.0	2.460	2 23	541
April 29.	do	185	248 0	2.410	2 32	567
May 14.	do	188	378 0	3 586	3 02	1,354
June 2.	do	192	405.5	3.850	3 23	1,561
June 24.	do	190	285.5	2 706	2 60	773
July 10.	do	180	264.0	2.640	2 45	696
July 25.	do	175	174.0	1 850	2 04	323
Aug. 12.	do	145	146.0	1.620	1 80	237
Aug. 26.	do	155	149.0	1 720	1 83	257
Sept. 7.	do	140	130.0	1 300	1.67	170
Sept. 24.	do	150	146.0	1 540	1 80	226
Oct. 8.	do	145	179.0	1.460	1.85	260
Nov. 2.	do	175	218.0	2 190	2 18	477
Nov. 17.	do	180	303.0	1.230	2.98	374
Dec. 10.	do	120	159.5	0.800	2 75	127
Dec. 29.	do	180	156.0	1 080	3 66	168

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Cowley, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	1.94	160a	2 26	85	2 36	87	1.54	148	2.15	455	2 98	1,266
2.	1.98	159	2 25	85	2 31	86	1.52	155	3.50	1,960	3 24	1,602
3.	2.02	158	2 28	85	2 28	86	1.57	162	3.15	1,485	3.38	1,792
4.	2.02	157	2 20	85	2 26	84	1.59	169	2.95	1,230	3.54	2,016
5.	2.04	156	2 30	86	2 23	84	1.63	173a	2.85	1,115	3.32	1,708
6.	2 08	153	2 30	87	2 18	84	1.68	172	2.75	1,005	3.18	1,524
7.	2 08	151	2 30	87	2 18	84	1.63	152	2.57	810	3 10	1,420
8.	2 10	149	2 30	87	2 08	84	1.58	133	2.60	840	2 98	1,266
9.	2 10	146	2 31	87	2 03	84	1.64	156	3.02	1,316	2 82	1,082
10.	2 11	143	2 31	88	1.88	84	1.64	156	3.14	1,472	2 75	1,005
11.	2 13	140	2 33	90	1.75	84	1.69	176	2.95	1,230	2 75	1,005
12.	2 14	136	2 35	91	1.84	85	1.74	200	2.85	1,115	2 75	1,005
13.	2 14	133	2 36	92	1.84	86	1.79	225	2.93	1,206	2 85	1,115
14.	2 16	129	2 35	94	1.85	86	2.25	530	2.97	1,254	3.05	1,355
15.	2 18	123	2 34	96	1.87	86	2.24	422	3.25	1,615	3.05	1,355
16.	2 18	120	2 35	97	1.88	87	2.22	506	3.31	1,694	3.07	1,381
17.	2 16	116	2 36	98	1.80	89	2.19	483	3.37	1,778	3.09	1,407
18.	2 18	112	2 39	98	1.75	90	2.16	462	3.36	1,764	3.07	1,381
19.	2 21	109	2 39	95	1.70	92	2.14	448	3.27	1,641	3.00	1,290
20.	2 21	105	2 39	95	1.65	95	2.09	413	3.25	1,615	2.95	1,230
21.	2 21	102	2 37	93	1.60	98	2.18	476	3.13	1,459	2 85	1,115
22.	2 19	100	2 37	92	1.60	100	2.32	586	3.06	1,368	2 78	1,038
23.	2 19	98	2 37	90	1.61	102	2.26	538	3.02	1,316	2 61	851
24.	2 19	96	2 39	90	1.61	106	2.25	530	3.19	1,537	2 60	840
25.	2 20	94	2 41	89	1.59	110	2.19	483	3.32	1,708	2 74	994
26.	2 22	92	2 42	88	1.57	114	2 29	562	3.19	1,537	3 08	1,394
27.	2 23	90	2 42	87	1.56	118	2 32	586	3.10	1,420	2 99	1,278
28.	2 25	90	2 40	87	1.56	123	2 36	618	3.00	1,290	2 98	1,266
29.	2 26	89			1.56	128	2 39	642	2 97	1,254	2 92	1,194
30.	2 26	88			1.56	135	2 45	695	2 82	1,082	2 82	1,082
31.	2 27	86			1.54	142			2 88	1,148		

a to a Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Cowley, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.75	1,005	1.91	296	1.72	190	1.74	200	2.12	434	1.98	280
2.....	2.75	1,005	1.90	290	1.70	180	1.74	200	2.13	441	2.07	250
3.....	2.74	994	1.90	290	1.70	180	1.78	220	2.14	448	2.40	212
4.....	2.70	950	1.88	278	1.68	172	1.84	254	2.14	448	2.38	172
5.....	2.72	972	1.86	266	1.68	172	1.85	260	2.14	448	2.36	153
6.....	2.68	928	1.85	260	1.67	168	1.86	266	2.08	406	2.50	142
7.....	2.62	862	1.85	260	1.66	164	1.86	266	2.09	413	2.90	135
8.....	2.61	851	1.88	278	1.73	195	1.88	278	2.09	413	2.92	130
9.....	2.51	750	1.90	290	1.70	180	1.90	290	2.03	371	2.93	128
10.....	2.48	722	1.90	290	1.70	180	1.90	290	2.00	350	2.93	127
11.....	2.40	650	1.88	278	1.70	180	1.92	302	1.98	338	2.84	128
12.....	2.39	642	1.80	230	1.70	180	1.92	302	2.00	350	2.44	129
13.....	2.38	634	1.78	220	1.70	180	1.92	302	2.04	378	3.25	129
14.....	2.36	618	1.76	210	1.68	172	1.94	314	1.86	266	3.55	130
15.....	2.31	578	1.76	210	1.71	185	2.04	378	1.84	254	3.36	131
16.....	2.31	578	1.75	205	1.70	180	2.25	530	2.30	340a	3.33	132
17.....	2.26	538	1.85	260	1.70	180	2.75	1,005	2.18	374	3.27	134
18.....	2.20	490	2.20	490	1.73	195	2.78	1,038	2.06	380	3.77	136
19.....	2.18	476	1.99	344	1.76	210	2.72	972	2.00	385	3.18	138
20.....	2.15	455	1.98	338	1.86	266	2.58	820	2.14	388	3.26	141
21.....	2.15	455	1.92	302	1.90	290	2.40	650	2.12	389	3.59	143
22.....	2.12	434	1.86	266	1.84	254	2.32	586	2.02	388	3.63	146
23.....	2.10	420	1.90	290	1.88	278	2.30	570	2.00	386	3.60	149
24.....	2.06	392	1.92	302	1.80	230	2.24	522	2.02	382	3.41	152
25.....	2.05	385	1.90	290	1.80	230	2.20	490	2.10	379	3.41	155
26.....	2.02	364	1.86	266	1.79	225	2.16	462	2.11	370	3.49	158
27.....	2.00	350	1.81	236	1.79	225	2.14	448	2.16	359	3.52	161
28.....	1.96	326	1.77	215	1.78	220	2.12	434	2.03	343	3.42	164
29.....	1.94	314	1.76	210	1.76	210	2.10	420	2.03	324	3.64	168
30.....	1.94	314	1.78	220	1.74	200	2.10	420	2.03	304	3.62	172
31.....	1.90	290	1.75	205	.....	.....	2.10	420	.....	.....	3.53	175a

a to a Ice conditions.

MONTHLY DISCHARGE of Oldman River near Cowley, for 1914.

(Drainage area 800 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	160	86	122	0.152	0.18	7,501
February.....	98	85	90	0.112	0.12	4,998
March.....	142	84	97	0.121	0.14	5,964
April.....	695	133	372	0.465	0.52	22,136
May.....	1,960	455	1,346	1.680	1.94	82,743
June.....	2,016	840	1,275	1.590	1.77	75,850
July.....	1,005	290	605	0.756	0.87	37,200
August.....	490	205	270	0.338	0.39	16,602
September.....	290	164	202	0.252	0.28	12,020
October.....	1,038	200	449	0.561	0.65	27,608
November.....	448	254	375	0.469	0.52	22,314
December.....	280	127	155	0.194	0.22	9,531
The year.....	.....	.....	.....	.....	7.60	324,437



Gauging Station on Oldman River near Cowley, Alberta. Taken by G. H. Whyte.



Gauging Station on Oldman River near Macleod, Alberta. Taken by G. H. Whyte.

SESSIONAL PAPER No. 25c

CANYON CREEK NEAR MOUNTAIN MILL.

Location.—On the NE. $\frac{1}{4}$ Sec. 14, Tp. 6, Rge. 2, W. 5th Mer.

Records available.—April 10, 1911, to October 31, 1914. Discharge measurements from 1910.

Gauge.—Vertical staff.

Bench-mark.—Spike in tree on left bank; elevation, 14.49 feet above zero of gauge.

Channel.—Clean gravel and rock.

Discharge measurements.—During high stages made at traffic bridge one-half mile upstream; at ordinary stages by wading below the gauge.

Winter flow.—Station not maintained during the winter.

Observer.—G. Biron.

DISCHARGE MEASUREMENTS of Canyon Creek near Mountain Mill, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 1.....	F. R. Burfield.....	5.0	4.65	0.535	4.34	2.5
April 15.....	J. E. Caughey.....	22.5	23.00	1.750	4.97	40.2
April 30.....	do.....	22.5	19.30	1.520	4.79	29.5
May 18.....	do.....	22.0	17.30	1.310	4.67	22.7
June 8.....	do.....	20.0	12.70	0.933	4.48	11.8
June 27.....	do.....	22.0	16.00	1.200	4.61	19.2
July 14.....	do.....	18.0	8.20	0.821	4.22	6.7
July 29.....	do.....	8.0	4.20	0.600	4.05	2.9
Aug. 10.....	do.....	5.0	2.36	1.090	4.03	2.5
Aug. 27.....	do.....	5.0	2.30	1.390	4.10	3.2
Sept. 11.....	do.....	5.0	2.20	1.210	4.05	2.7
Sept. 24.....	do.....	5.0	2.30	1.340	4.05	3.1
Oct. 15.....	do.....	11.0	11.60	2.660	4.77	31.0
Nov. 5.....	do.....	9.0	6.50	2.010	4.51	13.1

DAILY GAUGE HEIGHT AND DISCHARGE of Canyon Creek near Mountain Mill, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			4.37	4.4	4.77	28.0	4.49	14.6
2.....			4.28	3.1	4.78	28.0	4.47	13.8
3.....			4.27	3.3	4.80	29.0	4.44	12.8
4.....			4.28	3.8	4.83	31.0	4.44	12.8
5.....			4.32	5.1	4.84	31.0	4.44	12.8
6.....			4.34	5.9	4.79	28.0	4.47	13.8
7.....			4.36	6.9	4.77	28.0	4.45	13.2
8.....			4.36	7.4	4.75	26.0	4.40	11.4
9.....			4.40	9.0	4.76	27.0	4.41	11.8
10.....			4.51	13.2	4.77	28.0	4.38	10.8
11.....			4.52	14.2	4.77	28.0	4.38	10.8
12.....			4.84	30.0a	4.80	29.0	4.34	9.6
13.....			4.84	31.0	4.79	28.0	4.38	10.8
14.....			4.89	34.0	4.76	27.0	4.53	16.1
15.....			4.93	37.0	4.73	26.0	4.51	15.3
16.....			4.90	35.0	4.71	24.0	4.47	13.8
17.....	3.99	1.00a	4.86	33.0	4.70	24.0	4.41	11.8
18.....	4.06	1.00	4.83	31.0	4.67	22.0	4.35	9.9
19.....	4.07	1.00	4.81	30.0	4.67	22.0	4.33	9.3
20.....	4.13	1.00	5.03	45.0	4.65	22.0	4.32	9.0
21.....	4.14	1.00	4.93	37.0	4.64	21.0	4.29	8.2
22.....	4.24	1.00	4.94	38.0	4.62	20.0	4.29	8.2
23.....	4.25	1.00	4.89	34.0	4.61	20.0	4.26	7.4
24.....	4.47	4.80	4.90	35.0	4.60	19.0	4.27	7.6
25.....	4.22	1.10	4.85	32.0	4.61	20.0	4.54	16.5
26.....	4.28	1.50	4.82	30.0	4.48	14.2	4.82	30.0
27.....	4.43	4.00	4.80	29.0	4.56	17.4	4.61	19.5
28.....	4.35	2.60	4.79	28.0	4.58	18.2	4.52	15.7
29.....	4.35	3.00	4.82	30.0	4.52	15.7	4.36	10.2
30.....	4.35	3.30	4.73	28.0	4.52	15.7	4.43	12.4
31.....	4.36	3.80			4.51	15.3		

a to a Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Canyon Creek near Mountain Mill, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	4.41	11.8	4.01	2.30	4.08	3.5	4.10	3.8
2	4.38	10.8	3.97	1.60	4.08	3.5	4.12	4.2
3	4.34	9.6	3.97	1.60	4.07	3.3	4.15	4.8
4	4.31	8.7	3.96	1.50	4.05	3.0	4.19	5.7
5	4.36	10.2	3.95	1.40	4.06	3.1	4.16	5.1
6	4.32	9.0	3.95	1.40	4.05	3.0	4.16	5.1
7	4.31	8.7	3.95	1.40	4.05	3.0	4.20	5.9
8	4.28	7.9	3.95	1.40	4.10	3.8	4.17	5.3
9	4.25	7.2	4.00	2.10	4.06	3.1	4.20	5.9
10	4.24	6.9	4.04	2.80	4.06	3.1	4.24	6.9
11	4.24	6.9	3.98	1.80	4.05	3.0	4.23	6.6
12	4.22	6.4	3.99	2.00	4.06	3.1	4.24	6.9
13	4.22	6.4	4.02	2.40	4.08	3.5	4.28	7.9
14	4.22	6.4	3.95	1.40	4.06	3.1	4.48	14.2
15	4.21	6.2	3.95	1.40	4.11	4.0	4.77	28.0
16	4.19	5.7	3.94	1.20	4.10	3.8	4.89	34.0
17	4.18	5.5	4.30	8.40	4.11	4.0	4.87	33.0
18	4.18	5.5	4.25	7.20	4.08	3.5	4.88	34.0
19	4.15	4.8	4.11	4.00	4.06	3.1	4.80	29.0
20	4.13	4.4	4.06	3.10	4.08	3.5	4.74	26.0
21	4.12	4.2	4.10	3.80	4.10	3.8	4.70	24.0
22	4.12	4.2	4.05	3.00	4.09	3.6	4.64	21.0
23	4.11	4.0	4.22	6.40	4.09	3.6	4.51	15.3
24	4.10	3.8	4.18	5.50	4.08	3.5	4.59	18.6
25	4.09	3.6	4.16	5.10	4.07	3.3	4.57	17.8
26	4.08	3.5	4.12	4.20	4.06	3.1	4.56	17.4
27	4.07	3.3	4.10	3.80	4.07	3.3	4.54	16.5
28	4.05	3.0	4.10	3.80	4.09	3.6	4.54	16.5
29	4.04	2.8	4.10	3.80	4.10	3.8	4.52	15.7
30	4.03	2.6	4.09	3.60	4.09	3.6	4.50	14.9
31	4.03	2.6	4.09	3.60			4.49	14.6

MONTHLY DISCHARGE of Canyon Creek near Mountain Mill, for 1914.

(Drainage area 27 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (17-31)	4.8	1.00	2.1	0.078	0.04	62
April	45.0	3.10	23.0	0.852	0.95	1,369
May	31.0	14.20	24.0	0.889	1.02	1,476
June	30.0	7.40	12.7	0.470	0.52	756
July	11.8	2.60	6.0	0.222	0.26	369
August	8.4	1.20	3.1	0.115	0.13	191
September	4.0	3.00	3.4	0.126	0.14	202
October	34.0	3.80	15.0	0.556	0.64	922
The period					3.70	5,347

SESSIONAL PAPER No. 25c

MILL CREEK NEAR MOUNTAIN MILL.

Location.—On the SW. $\frac{1}{4}$ Sec. 18, Tp. 6, Rgc. 1, W. 5th Mer.

Records available.—July 7, 1910, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 93.41 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Coarse gravel.

Discharge measurements.—By wading at ordinary stages, and from bridge at flood stages.

Winter flow.—Station not maintained during the winter.

Observer.—K. B. Parsons.

DISCHARGE MEASUREMENTS of Mill Creek near Mountain Mill, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 28.....	F. R. Burfield.....	14	12.5	1.78	.....a	22
April 15.....	J. E. Caughy.....	44	48.0	2.79	2.20	134
April 30.....	do.....	43	49.2	2.86	2.25	141
April 18.....	do.....	59	88.1	3.49	2.77	307
June 8.....	do.....	45	50.4	3.11	2.37	156
June 27.....	do.....	48	64.5	3.71	2.66	239
July 14.....	do.....	42	39.0	2.47	2.07	96
July 29.....	do.....	36	25.5	1.67	1.85	42
Aug. 10.....	do.....	36	23.6	1.33	1.75	31
Aug. 27.....	do.....	39	30.2	2.02	1.95	61
Sept. 11.....	do.....	36	24.0	1.57	1.78	38
Sept. 24.....	do.....	39	30.6	2.00	1.93	62
Nov. 5.....	do.....	44	42.4	2.49	2.15	106

a Solid ice about the gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Mill Creek near Mountain Mill, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.42	179	2.53	211
2.....			2.55	217	2.71	267
3.....			2.56	220	2.92	336
4.....			2.61	235	2.93	339
5.....			2.59	229	2.85	312
6.....			2.49	199	2.60	232
7.....			2.45	188	2.42	179
8.....			2.45	188	2.37	165
9.....			2.57	223	2.26	136
10.....			2.74	277	2.24	130
11.....			2.70	264	2.22	125
12.....			2.62	238	2.45	188
13.....	2.13	104	2.60	232	2.62	238
14.....	2.14	106	2.73	274	2.85	312
15.....	2.19	118	2.78	290	2.54	214
16.....	2.16	111	2.83	306	2.55	217
17.....	2.05	86	2.83	306	2.53	211
18.....	2.01	77	2.74	277	2.57	223
19.....	2.09	95	2.69	261	2.44	185
20.....	2.38	168	2.63	242	2.37	165
21.....	2.33	154	2.61	235	2.32	151
22.....	2.23	128	2.58	226	2.28	141
23.....	2.30	146	2.56	220	2.22	125
24.....	2.35	160	2.53	211	2.17	113
25.....	2.35	160	2.50	202	2.24	130
26.....	2.36	162	2.49	199	2.95	346
27.....	2.36	162	2.46	190	2.66	251
28.....	2.38	168	2.41	176	2.55	217
29.....	2.25	133	2.38	168	2.48	196
30.....	2.27	138	2.34	157	2.45	188
31.....			2.44	185		

DAILY GAUGE HEIGHT AND DISCHARGE of Mill Creek near Mountain Mill, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.35	160	1.77	35	1.85	48	1.87	51	2.15	108
2.....	2.34	157	1.75	32	1.85	48	1.89	54	2.15	108
3.....	2.27	138	1.74	31	1.85	48	1.89	54	2.30	146
4.....	2.26	136	1.74	31	1.85	48	1.93	62	.....	.....
5.....	2.25	133	1.73	30	1.85	48	1.95	66	.....	.....
6.....	2.25	133	1.73	30	1.85	48	1.86	49	.....	.....
7.....	2.23	128	1.72	29	1.85	48	1.84	46	.....	.....
8.....	2.16	111	1.72	29	1.85	48	1.90	56	.....	.....
9.....	2.15	108	1.71	27	1.83	44	1.95	66	.....	.....
10.....	2.12	102	1.75	32	1.80	39	2.00	75	.....	.....
11.....	2.10	97	1.74	31	1.78	36	2.00	75	.....	.....
12.....	2.07	90	1.80	39	1.77	35	1.96	67	.....	.....
13.....	2.07	90	1.80	39	1.76	34	2.04	84	.....	.....
14.....	2.06	88	1.71	27	1.75	32	2.78	290	.....	.....
15.....	2.04	84	1.71	27	1.83	44	3.08	389	.....	.....
16.....	2.03	82	2.26	136	1.85	48	3.12	403	.....	.....
17.....	2.02	79	2.45	188	1.85	48	3.15	413	.....	.....
18.....	2.01	77	2.20	120	1.87	51	2.90	329	.....	.....
19.....	1.99	73	2.10	97	1.90	56	2.70	264	.....	.....
20.....	1.97	69	2.00	75	1.92	60	2.60	232	.....	.....
21.....	1.94	64	2.10	97	1.94	64	2.50	202	.....	.....
22.....	1.91	58	2.08	93	1.95	66	2.40	173	.....	.....
23.....	1.90	56	2.10	97	1.94	64	2.35	160	.....	.....
24.....	1.90	56	2.00	75	1.94	64	2.30	146	.....	.....
25.....	1.88	53	1.97	69	1.92	60	2.30	146	.....	.....
26.....	1.87	51	1.95	66	1.87	51	2.30	146	.....	.....
27.....	1.86	49	1.95	66	1.85	48	2.30	146	.....	.....
28.....	1.85	48	1.95	66	1.83	44	2.23	128	.....	.....
29.....	1.83	44	1.91	58	1.82	42	3.15	413	.....	.....
30.....	1.82	42	1.90	56	1.81	41	2.15	108	.....	.....
31.....	1.80	39	1.89	54	.....	.....	2.22	125	.....	.....

MONTHLY DISCHARGE of Mill Creek near Mountain Mill, for 1914.

(Drainage area 64 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (13-30).....	168	77	132	2.06	1.38	4,713
May.....	306	157	226	3.53	4.07	13,896
June.....	346	113	208	3.25	3.63	12,377
July.....	160	39	87	1.36	1.57	5,349
August.....	188	27	61	0.95	1.10	3,751
September.....	66	32	48	0.75	0.84	2,856
October.....	413	46	162	2.53	2.92	9,961
November (1-3).....	146	108	121	1.89	0.21	720
The period.....	.....	.....	.....	.....	15.72	53,623

CASTLE (SOUTH FORK) RIVER NEAR COWLEY.

Location.—On the SW. $\frac{1}{4}$ Sec. 2, Tp. 7, Rge. 1, W. 5th Mer., at G. W. Buchanan's ranch.

Records available.—August 5, 1909, to December 31 1914. Discharge measurements from 1908.

Gauge.—Vertical staff; elevation of zero maintained at 92.34 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Coarse gravel, and not liable to shift.

Discharge measurements.—Made from the bridge at all stages.

Observer.—G. W. Buchanan.

SESSIONAL PAPER No. 25c

DISCHARGE MEASUREMENTS of Castle (South fork) River near Cowley, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 16.	R. Palmer	80	176	0.966	3.20	171
Feb. 25.	E. W. W. Hughes	74	301	0.658	3.43	198
Mar. 12.	F. R. Burfield.	75	142	0.885	2.90	126
Mar. 25.	do				3.90	
April 13.	J. E. Caughey	100	225	2.480	2.69	557
May 1.	do	150	317	3.300	3.21	1,047
May 15.	do	213	518	4.420	4.00	2,287
June 3.	do	207	565	4.790	4.46	2,709
June 29.	do	125	342	3.420	3.40	1,168
July 11.	do	110	256	2.760	2.85	705
July 27.	do	78	106	3.218	2.31	340
Aug. 11.	do	59	79	2.750	2.09	217
Aug. 25.	do	102	217	2.360	2.53	512
Sept. 10.	do	60	101	2.630	2.14	266
Sept. 26.	do	98	197	2.130	2.43	419
Oct. 16.	do	174	437	4.030	3.92	1,760
Nov. 4.	do	105	275	2.840	2.95	781
Nov. 18.	do	77	146	3.830	2.75	556
Dec. 9.	do	50	86	2.660	4.75	218
Dec. 31.	do	84	256	1.150	3.58	305

a On March 25 impossible to measure stream due to ice jam below gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Castle (South fork) River near Cowley, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.68	114a	2.72	88	2.80	190	2.78	646	3.21	1,010	3.85	1,835
1.....	2.67	123	2.65	94	2.75	184	2.85	695	3.59	1,457	4.15	2,292
3.....	2.60	132	2.70	102	2.71	177	2.90	730	4.14	2,277	4.45	2,770
4.....	2.60	147	2.75	112	2.70	169	2.91	738	3.99	2,045	4.55	2,930
5.....	2.70	162	2.80	121	2.68	163	3.16	960	3.64	1,526	4.00	2,060
6.....	2.85	170	2.85	130	2.70	155	3.16	960	3.49	1,327	3.80	1,760
7.....	2.75	180	2.85	137	2.67	149	3.07	873	3.44	1,262	3.55	1,405
8.....	2.65	183	2.85	144	2.65	144	3.15	950	3.39	1,199	3.50	1,340
9.....	2.63	185	2.90	151	2.60	139	3.15	950	3.65	1,540	3.25	1,050
10.....	2.63	186	2.90	157	2.53	134	3.18	980	3.70	1,610	3.25	1,050
11.....	2.60	185	2.95	163	2.40	131	3.13	1,030	3.75	1,685	3.20	1,000
12.....	2.65	184	2.97	167	2.35	127	3.08	882	3.70	1,610	3.20	1,000
13.....	2.65	182	2.95	172	2.30	123	2.84	688	3.70	1,610	3.50	1,340
14.....	2.67	179	2.95	176	2.25	120	2.79	653	3.80	1,760	3.90	1,910
15.....	2.65	176	3.00	180	2.15	117	2.89	723	3.95	1,985	3.85	1,835
16.....	2.60	171	3.03	183	2.08	114	2.94	762	4.15	2,292	3.70	1,610
17.....	2.59	168	3.05	186	2.00	113	2.94	762	4.25	2,450	3.80	1,760
18.....	2.57	162	2.90	188	1.90	110	2.88	716	4.35	2,610	3.80	1,760
19.....	2.50	155	2.96	192	1.88	108	3.14	940	4.25	2,450	3.80	1,760
20.....	2.45	148	2.95	193	1.85	107	3.54	1,392	4.00	2,060	3.80	1,760
21.....	2.50	140	2.99	195	1.87	105	3.39	1,199	3.90	1,910	3.45	1,275
22.....	2.55	128	3.00	196	1.85	105	3.34	1,144	3.80	1,760	3.30	1,100
23.....	2.60	118	2.99	197	1.85	106	3.21	1,010	3.75	1,685	3.19	990
24.....	2.68	108	2.98	198	1.80	107	3.24	1,040	4.10	2,215	3.09	891
25.....	2.70	95	2.88	199	3.28	109	3.29	1,090	4.25	2,450	3.44	1,262
26.....	2.75	88	2.93	198	3.25	112	3.24	1,040	3.95	1,985	3.69	1,596
27.....	2.70	83	2.90	195	3.30	115	3.19	990	3.75	1,685	3.54	1,392
28.....	2.70	82	2.85	193	3.23	120	3.14	940	3.70	1,610	3.44	1,262
29.....	2.70	82			3.20	128	3.09	891	3.50	1,340	3.39	1,199
30.....	2.72	83			3.15	250	3.04	846	3.50	1,340	3.34	1,144
31.....	2.75	84			2.90	450a			3.60	1,470		

a to a Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Castle (South fork) River near Cowley, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	3.24	1,040	2.10	250	2.20	300	2.30	350	2.88	716	2.55	490
2.....	3.19	990	2.10	250	2.15	275	2.30	350	2.98	794	2.55	490
3.....	3.14	940	2.15	275	2.10	250	2.30	350	2.97	786	2.40	400
4.....	3.09	891	2.13	265	2.10	250	2.30	350	2.95	770	2.30	350
5.....	3.04	846	2.13	265	2.10	250	2.33	365	3.02	828	2.35	375
6.....	3.04	846	2.10	250	2.10	250	2.35	375	3.00	810	2.40	400
7.....	2.97	780	2.10	250	2.10	250	2.35	375	2.95	770	2.45	430
8.....	2.94	762	2.10	250	2.13	265	2.42	412	2.90	730	3.00	226b
9.....	2.94	762	2.10	250	2.10	250	2.40	400	2.85	695	4.70	218
10.....	2.89	723	2.10	250	2.10	250	2.45	430	2.83	681	3.99	218
11.....	2.85	695	2.10	250	2.10	250	2.45	430	2.80	660	3.69	220
12.....	2.80	660	2.10	250	2.10	250	2.48	448	2.75	625	3.69	223
13.....	2.78	646	2.10	250	2.10	250	2.48	448	2.70	590	3.51	226
14.....	2.75	625	2.05	230	2.10	250	3.20	1,000	2.65	555	3.64	231
15.....	2.75	625	2.03	222	2.10	250	3.45	1,275	2.65	555a	3.79	235
16.....	2.78	646	2.00	210	2.10	250	3.80	1,760	2.60	555	3.44	240
17.....	2.62	534	2.50	460	2.10	250	4.00	2,060	2.78	556	3.59	245
18.....	2.58	508	3.00	810	2.10	250	4.05	2,138	2.75	556	3.34	250
19.....	2.50	460	2.75	625	2.16	280	3.95	1,985	2.70	540	3.59	256
20.....	2.50	460	2.55	490	2.25	325	3.95	1,985	2.65	522a	3.64	262
21.....	2.45	430	2.50	460	2.60	520	3.78	1,730	2.60	510	3.73	269
22.....	2.45	430	2.45	430	2.53	478	3.73	1,655	2.55	490	3.81	274
23.....	2.40	400	2.55	490	2.45	430	3.58	1,444	2.52	472	3.78	280
24.....	2.40	400	2.60	520	2.45	430	3.45	1,275	2.48	448	3.83	286
25.....	2.35	375	2.53	478	2.43	418	3.30	1,100	2.55	490	3.88	293
26.....	2.31	355	2.43	418	2.40	400	3.15	950	2.55	490	3.81	297
27.....	2.31	355	2.40	400	2.35	375	2.98	794	2.55	490	3.96	300
28.....	2.29	345	2.35	375	2.35	375	2.85	695	2.55	490	3.88	303
29.....	2.25	325	2.28	340	2.30	350	2.85	695	2.55	490	3.80	305
30.....	2.25	325	2.25	325	2.30	350	2.80	660	2.55	490	3.75	305
31.....	2.20	300	2.25	325			2.80	660			3.56	305b

a to a Ice conditions.

b to b Ice conditions.

MONTHLY DISCHARGE of Castle (South fork) River, near Cowley, for 1914.

(Drainage area 348 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	186	82	141	0.405	0.47	8,670
February.....	199	88	164	0.471	0.49	9,108
March.....	450	105	145	0.416	0.48	8,916
April.....	1,392	646	907	2.610	2.91	53,970
May.....	2,610	1,010	1,781	5.120	5.90	109,483
June.....	2,930	891	1,545	4.440	4.95	91,912
July.....	1,040	300	596	1.710	1.97	36,647
August.....	810	210	352	1.010	1.16	21,644
September.....	520	250	311	0.894	1.00	18,506
October.....	2,138	350	934	2.680	3.09	57,429
November.....	828	448	605	1.740	1.94	36,000
December.....	490	218	297	0.853	0.98	18,262
The year.....					25.34	470,547

SESSIONAL PAPER No. 25c

PINCHER CREEK AT PINCHER CREEK.

Location.—On the SW. $\frac{1}{4}$ Sec. 23, Tp. 6, Rge. 30, W. 4th Mer., in the town of Pincher Creek.

Records available.—April 1, 1910, to October 31, 1914. Discharge measurements from 1906.

Gauge.—Vertical staff; elevation of zero maintained at 86.35 feet since establishment.

Bench-mark.—On right concrete abutment of bridge; assumed elevation, 100.00 feet.

Channel.—Rock, gravel and gumbo.

Discharge measurements.—From bridge and by wading.

Winter flow.—Station not maintained during the winter.

Observer.—Hugh Bertles.

DISCHARGE MEASUREMENTS of Pincher Creek at Pincher Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 30.....	F. R. Burfield.....	28	13.0	1.030	2.36	13.3
April 16.....	J. E. Caughey.....	46	43.0	2.070	2.83	89.0
May 1.....	do.....	45	40.7	1.870	2.74	76.0
May 15.....	do.....	51	53.6	2.534	3.00	136.0
June 3.....	do.....	48	46.9	2.010	2.85	94.0
June 29.....	do.....	46	41.0	1.863	2.76	76.0
July 11.....	do.....	36	22.2	1.145	2.35	25.0
July 27.....	do.....	26	12.4	0.767	2.14	9.5
Aug. 13.....	do.....	24	10.0	0.702	2.05	7.0
Aug. 25.....	do.....	46	30.3	1.240	2.45	38.0
Sept. 10.....	do.....	26	13.4	0.980	2.15	13.1
Sept. 26.....	do.....	37	19.4	1.290	2.29	25.0
Nov. 4.....	do.....	38	24.3	1.620	2.50	39.0

DAILY GAUGE HEIGHT AND DISCHARGE of Pincher Creek at Pincher Creek, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			2.18	7.0	2.70	68	2.65	60
2.....			2.17	7.0	2.85	96	2.68	65
3.....			2.16	7.2	2.93	116	2.78	82
4.....			2.22	9.6	2.90	108	2.85	96
5.....			2.66	50.0	2.80	85	2.80	85
6.....			2.62	46.0	2.80	85	2.75	76
7.....			2.57	43.0	2.80	85	2.65	60
8.....			2.44	30.0	2.80	85	2.60	53
9.....			2.57	46.0	2.95	122	2.54	45
10.....			2.57	48.0a	3.20	198	2.54	45
11.....			2.64	59.0	3.00	136	2.52	43
12.....	2.76	52.0a	2.75	76.0	2.95	122	2.53	44
13.....	2.73	48.0	2.75	76.0	2.93	116	2.55	46
14.....	2.60	33.0	2.75	76.0	2.95	122	2.86	99
15.....	2.45	19.6	2.75	76.0	2.96	125	2.80	85
16.....	2.27	8.5	2.75	76.0	2.98	130	2.79	83
17.....	2.25	8.0	2.65	60.0	2.96	125	2.67	64
18.....	2.42	17.5	2.60	53.0	2.94	119	2.66	62
19.....	2.29	9.6	2.64	59.0	2.91	111	2.66	62
20.....	2.27	8.5	2.92	114.0	2.88	103	2.62	56
21.....	2.32	11.2	2.78	82.0	2.84	94	2.57	49
22.....	2.22	7.2	2.78	82.0	2.80	85	2.53	44
23.....	2.27	8.5	2.75	76.0	2.77	80	2.52	43
24.....	2.22	7.2	2.80	85.0	2.82	90	2.52	43
25.....	2.32	11.2	2.75	76.0	2.84	94	3.04	148
26.....		11.6b	2.75	76.0	2.80	85	2.98	130
27.....		12.1	2.65	60.0	2.75	76	2.82	90
28.....		12.5	2.70	68.0	2.70	68	2.77	80
29.....		13.0b	2.65	60.0	2.65	60	2.72	71
30.....	2.36	13.4	2.65	60.0	2.62	56	2.67	64
31.....	2.57	31.0			2.63	58		

a to a Ice conditions.

b to b Discharges interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Pincher Creek at Pincher Creek, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.	2.62	56.0	2.07	7.8	2.26	18.2	2.25	17.5
2.	2.62	56.0	2.05	7.2	2.26	18.2	2.25	17.5
3.	2.62	56.0	2.03	6.8	2.24	16.8	2.35	26.0
4.	2.62	56.0	2.02	6.5	2.21	14.7	2.35	26.0
5.	2.72	71.0	2.01	6.2	2.21	14.7	2.35	26.0
6.	2.67	64.0	2.01	6.2	2.21	14.7	2.35	26.0
7.	2.62	56.0	2.01	6.2	2.21	14.7	2.35	26.0
8.	2.45	35.0	2.01	6.2	2.24	16.8	2.35	26.0
9.	2.40	30.0	2.08	8.0	2.21	14.7	2.50	40.0
10.	2.39	29.0	2.06	7.5	2.15	11.2	2.50	40.0
11.	2.36	26.0	2.04	7.0	2.15	11.2	2.50	40.0
12.	2.35	26.0	2.08	8.0	2.20	14.0	2.45	35.0
13.	2.37	27.0	2.06	7.5	2.18	12.9	2.43	33.0
14.	2.37	27.0	2.04	7.0	2.15	11.2	3.22	204.0
15.	2.36	26.0	2.01	6.2	2.25	17.5	3.23	207.0
16.	2.32	23.0	2.01	6.2	2.25	17.5	3.25	214.0
17.	2.30	21.0	2.37	27.0	2.25	17.5	3.25	214.0
18.	2.27	18.9	2.97	128.0	2.30	21.0	3.10	167.0
19.	2.25	17.5	2.55	46.0	2.35	26.0	3.00	136.0
20.	2.23	16.1	2.47	37.0	2.35	26.0	2.95	122.0
21.	2.22	15.4	2.41	31.0	2.35	26.0	2.85	96.0
22.	2.22	15.4	2.36	26.0	2.35	26.0	2.75	76.0
23.	2.21	14.7	2.51	41.0	2.32	23.0	2.68	65.0
24.	2.21	14.7	2.43	33.0	2.30	21.0	2.65	65.0
25.	2.20	14.0	2.43	33.0	2.30	21.0	2.60	53.0
26.	2.17	12.4	2.37	27.0	2.30	21.0	2.57	49.0
27.	2.15	11.2	2.35	26.0	2.28	19.6	2.53	44.0
28.	2.14	10.7	2.35	26.0	2.25	17.5	2.50	40.0
29.	2.12	9.6	2.29	20.0	2.25	17.5	2.50	40.0
30.	2.12	9.6	2.29	20.0	2.25	17.5	2.47	37.0
31.	2.10	8.5	2.29	20.0	.....	.....	2.45	35.0

MONTHLY DISCHARGE of Pincher Creek at Pincher Creek, for 1914.

(Drainage area 50 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (12-31).....	52	7.2	17.2	0.344	0.26	682
April.....	114	7.0	58.0	1.160	1.29	3,451
May.....	198	56.0	100.0	2.000	2.31	6,149
June.....	148	43.0	69.0	1.380	1.54	4,106
July.....	71	8.5	28.0	0.560	0.65	1,722
August.....	128	6.2	21.0	0.420	0.48	1,291
September.....	26	11.2	18.0	0.360	0.40	1,071
October.....	214	17.5	73.0	1.460	1.68	4,489
The period.....					8.61	22,961

SESSIONAL PAPER No. 25c

OLDMAN RIVER NEAR MACLEOD.

Location.—On the NW. $\frac{1}{4}$ Sec. 10, Tp. 9, Rge. 26, W. 4th Mer., at the traffic bridge.

Records available.—July 10, 1910, to December 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 91.47 feet during 1913; 87.67 feet during 1910, 1911, 1912 and 1914.

Bench-mark.—Permanent bench-mark established on concrete pier; assumed elevation. 100.00 feet.

Channel.—Shifts slightly.

Discharge measurements.—Above from bridge.

Winter flow.—Records are obtained during the winter season 600 feet below the bridge.

Observer.—Mrs. W. A. Jackson.

DISCHARGE MEASUREMENTS of Oldman River near Macleod, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 20.....	R. Palmer.....	105.0	362.0	0.74	4.45	267
Feb. 14.....	E. W. W. Hughes.....	96.0	216.0	1.04	3.90	224
Feb. 28.....	do.....	95.0	238.0	1.21	3.75	288
Mar. 14.....	F. R. Burfield.....	87.0	239.0	1.81	2.95	453
Mar. 31.....	do.....	95.0	272.0	1.84	2.68	499
April 17.....	J. E. Caughey.....	115.0	510.0	4.57	4.66	2,329
May 5.....	do.....	251.0	889.0	4.43	5.73	3,939
May 21.....	do.....	250.0	1,006.0	4.73	6.22	4,765
June 16.....	do.....	247.0	871.5	4.31	5.65	3,760
June 30.....	do.....	118.0	555.3	5.30	5.18	2,941
July 15.....	do.....	106.0	417.0	3.43	4.15	1,428
July 30.....	do.....	95.0	317.0	2.28	3.12	724
Aug. 15.....	do.....	96.0	278.0	1.74	2.70	484
Aug. 28.....	do.....	98.0	326.0	2.50	3.20	813
Sept. 14.....	do.....	94.0	287.0	1.87	2.75	537
Sept. 20.....	do.....	97.0	321.0	2.45	2.86	787
Oct. 17.....	do.....	249.0	826.0	4.90	5.64	4,056
Nov. 6.....	do.....	106.0	437.0	3.82	4.24	1,669
Nov. 20.....	do.....	96.0	371.0	3.00	3.65	1,112
Dec. 11.....	do.....				4.83	.....^a

^a Impossible to gauge on account of frazil ice.

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Macleod, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.00	300a	4.56	201	3.75	298	2.60	440	4.80	2,350	5.65	3,765
2.....	3.00	302	4.51	202	3.75	306	2.59	435	5.40	3,290	5.80	4,060
3.....	3.00	306	4.46	204	3.70	313	2.57	425	6.10	4,700	6.35	5,280
4.....	3.20	313	4.41	206	3.67	323	2.57	425	6.00	4,480	6.47	5,568
5.....	3.40	322	4.36	208	3.65	333	3.00	660	5.72	3,900	6.60	5,880
6.....	3.40	332	4.32	210	3.60	343	3.40	920	5.45	3,385	6.00	4,480
7.....	3.60	338	4.22	212	3.55	354	3.20	780	5.24	3,018	5.90	4,260
8.....	4.00	342	4.12	214	3.55	366	3.17	762	5.20	2,950	5.50	3,480
9.....	4.20	344	4.07	216	3.80	380	3.09	714	5.10	2,790	5.30	3,120
10.....	4.40	345	4.02	218	3.65	392	3.03	678	5.35	3,205	5.20	2,950
11.....	4.50	343	4.02	219	3.35	402	3.09	714	5.95	4,370	5.10	2,790
12.....	4.60	340	3.97	221	3.40	414	3.19	774	5.65	3,765	5.00	2,630
13.....	4.70	335	3.92	223	3.25	424	3.99	1,410	5.65	3,765	5.20	2,950
14.....	4.60	328	3.90	226	3.20	433	4.10	1,610	5.65	3,765	5.50	3,480
15.....	4.55	319	3.90	229	2.95	436a	4.34	1,774	5.75	3,960	5.70	3,860
16.....	4.50	310	3.87	233	2.60	440	4.39	1,829	6.25	5,045	5.70	3,860
17.....	4.45	300	3.87	236	2.80	540	4.69	2,197	6.40	5,400	5.75	3,960
18.....	4.30	290	3.82	240	2.80	540	4.44	1,888	6.45	5,520	5.80	4,060
19.....	4.20	280	3.81	244	2.65	465	4.24	1,664	6.40	5,400	5.75	3,960
20.....	4.45	269	3.71	247	2.60	440	4.74	2,266	6.35	5,280	5.70	3,860
21.....	4.50	258	3.76	252	2.57	425	5.09	2,774	6.24	5,022	5.55	3,575
22.....	4.55	246	3.71	256	2.55	415	4.79	2,336	5.90	4,260	5.30	3,120
23.....	4.55	233	3.61	263	2.65	465	4.79	2,336	5.85	4,160	5.18	2,918
24.....	4.60	224	3.60	267	2.70	490	5.29	3,103	5.93	4,326	5.00	2,630
25.....	4.60	218	3.65	273	2.55	415	5.49	3,461	6.18	4,884	5.00	2,630
26.....	4.60	212	3.68	277	2.20	220	4.80	2,350	6.17	4,861	5.80	4,060
27.....	4.60	208	3.71	284	2.25	260	4.75	2,280	6.00	4,480	5.60	3,670
28.....	4.61	204	3.75	290	2.50	390	4.70	2,210	5.85	4,160	5.40	3,290
29.....	4.61	202	.....	.....	2.60	440	4.55	2,020	5.60	3,670	5.15	2,870
30.....	4.61	201	.....	.....	2.70	490	4.50	1,960	5.52	3,518	5.00	2,630
31.....	4.61	200	.....	.....	2.68	480	.....	.....	5.50	3,480	.....	.....

a to a Ice conditions.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Oldman River near Macleod, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	4.90	2,490	3.04	684	2.95	630	3.04	684	4.02	1,440	3.50	946
2.....	4.85	2,420	3.00	660	2.90	600	3.00	660	4.02	1,440	3.45	890
3.....	4.83	2,392	3.00	660	2.88	588	3.00	660	4.17	1,590	3.40	820
4.....	4.80	2,350	2.98	648	2.86	576	3.10	720	4.17	1,500	3.35	740
5.....	4.80	2,350	2.95	630	2.82	552	3.20	780	4.12	1,540	3.30	670
6.....	4.75	2,280	2.90	600	2.79	535	3.30	850	4.10	1,720	2.10	590
7.....	4.70	2,210	2.87	582	2.76	520	3.35	885	4.09	1,510	2.20	520
8.....	4.60	2,080	2.83	558	3.01	664	3.37	899	4.07	1,490	2.60	463
9.....	4.50	1,960	2.80	540	2.92	612	3.39	913	4.05	1,470	2.40	430
10.....	4.40	1,840	3.00	660	2.82	552	3.40	920	4.02	1,440	3.70	415
11.....	4.32	1,752	2.90	600	2.80	540	3.42	934	3.99	1,410	4.90	408
12.....	4.20	1,620	2.90	600	2.77	525	3.45	955	3.91	1,330	4.90	403
13.....	4.15	1,570	2.90	600	2.72	500	3.60	1,070	3.86	1,290	4.80	407
14.....	4.15	1,570	2.85	570	2.80	540	3.70	1,150	3.81	1,245	4.90	410
15.....	4.10	1,520	2.75	515	2.85	570	4.50	1,960	3.51	1,200	5.00	413
16.....	4.00	1,420	2.60	440	2.87	582	5.20	2,950	3.70	1,145	5.10	415
17.....	3.90	1,320	2.75	515	2.90	600	5.60	3,670	2.40	1,120	5.00	420
18.....	3.83	1,257	3.40	920	3.10	720	5.80	4,060	3.00	1,116	4.90	425
19.....	3.80	1,230	4.15	1,570	3.30	850	5.50	3,480	3.70	1,112	4.80	428
20.....	3.76	1,198	3.90	1,320	3.50	990	5.30	3,120	3.65	1,115	4.80	433
21.....	3.73	1,174	3.60	1,070	3.45	955	5.05	2,710	4.40	1,122	4.80	437
22.....	3.70	1,150	3.35	885	3.40	920	4.90	2,490	3.70	1,140	4.80	443
23.....	3.60	1,070	3.50	990	3.35	885	4.71	2,224	3.60	1,156	4.80	448
24.....	3.55	1,030	3.70	1,150	3.25	815	4.51	1,972	3.60	1,163	4.80	450
25.....	3.40	920	3.60	1,070	3.17	762	4.36	1,796	3.65	1,162	4.80	455
26.....	3.35	885	3.47	969	3.15	750	4.31	1,741	3.75	1,150	4.70	460
27.....	3.27	829	3.35	885	3.13	738	4.21	1,631	3.75	1,138	4.60	463
28.....	3.18	768	3.20	780	3.13	738	4.11	1,530	3.70	1,105	4.50	468
29.....	3.15	750	3.20	780	3.10	720	4.06	1,480	3.60	1,060	4.40	470
30.....	3.12	732	3.05	690	3.05	690	4.03	1,450	3.55	1,000	4.28	475
31.....	3.08	708	3.00	660	.....	.....	4.02	1,440	.....	.....	4.20	478

b to b Ice conditions.

MONTHLY DISCHARGE of Oldman River near Macleod, for 1914.

(Drainage area 2,255 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	345	200	283	0.125	0.14	17,401
February.....	290	201	235	0.104	0.11	13,051
March.....	540	220	401	0.178	0.20	24,657
April.....	3,461	425	1,573	0.698	0.78	93,600
May.....	5,520	2,350	4,102	1.820	2.11	252,222
June.....	5,880	2,630	3,655	1.620	1.81	217,220
July.....	2,490	708	1,511	0.670	0.77	92,911
August.....	1,570	440	768	0.340	0.39	47,222
September.....	990	500	674	0.299	0.33	40,106
October.....	4,060	660	1,670	0.740	0.85	102,680
November.....	1,590	1,000	1,277	0.566	0.63	75,990
December.....	946	403	506	0.224	0.26	31,170
The year.....	.....	.....	.....	.....	8.38	1,007,000

WILLOW CREEK NEAR MACLEOD.

Location.—On the SE. $\frac{1}{4}$ Sec. 26, Tp. 9, Rge. 26, W. 4th Mer.

Records available.—July 1, 1909, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 90.84 feet during 1910-14.

Bench-mark.—Permanent iron bench-mark located 39 feet northwest of the gauge.

Channel.—Consists of clean gravel, and is not liable to shift.

Discharge measurements.—Made from the bridge during flood stages, and by wading at low stages.

Observer.—J. R. McLean.

DISCHARGE MEASUREMENTS of Willow Creek near Macleod, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
March 19.....	F. R. Burfield.....	31	90.2	1.12	2.31	101
April 6.....	J. E. Caughey.....	96	195.0	2.30	3.65	448
April 18.....	do.....	81	133.0	1.62	2.80	216
May 4.....	do.....	74	118.0	1.57	2.70	185
May 20.....	do.....	70	110.0	1.51	2.65	168
June 16.....	do.....	70	107.0	1.44	2.55	154
June 30.....	do.....	78	124.8	1.73	2.93	216
July 15.....	do.....	48	71.3	0.92	2.06	65
July 30.....	do.....	38	52.2	0.34	1.55	20
Aug. 15.....	do.....	40	53.8	0.51	1.65	27
Aug. 28.....	do.....	39	53.4	0.53	1.67	28
Sept. 14.....	do.....	24	20.4	1.08	1.56	22
Sept. 29.....	do.....	24	22.0	1.25	1.65	27
Oct. 17.....	do.....	68	116.0	1.64	2.77	190
Nov. 6.....	do.....	30	36.7	2.66	2.23	98

DAILY GAUGE HEIGHT AND DISCHARGE of Willow Creek near Macleod, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.91	236	2.47	132	2.35	109
2.....			2.96	249	2.50	138	2.35	109
3.....			2.85	220	2.50	138	2.30	100
4.....			2.58	156	2.50	138	2.28	97
5.....			2.95	246	2.70	183	2.28	97
6.....			3.65	448	2.65	172	2.25	92
7.....			3.20	316	2.50	138	2.25	92
8.....			2.75	195	2.50	138	2.25	92
9.....			2.68	178	2.65	172	2.23	89
10.....			2.60	160	2.65	172	2.23	89
11.....			2.57	153	2.70	183	2.20	84
12.....			2.52	142	2.74	193	2.20	84
13.....			2.60	160	2.70	183	2.20	84
14.....			2.76	197	2.64	169	2.18	81
15.....			2.83	215	2.65	172	2.45	128
16.....			2.70	183	2.64	169	2.54	147
17.....			2.80	207	2.64	169	2.54	147
18.....			2.76	197	2.64	169	2.50	138
19.....	2.31	102	2.65	172	2.65	172	2.46	130
20.....	2.20	84	2.60	160	2.65	172	2.40	118
21.....	2.15	77	2.52	142	2.65	172	2.35	109
22.....	2.08	68	2.40	118	2.65	172	2.20	84
23.....	1.92	50	2.40	118	2.65	172	2.12	73
24.....	1.82	41	2.45	128	2.60	160	2.20	84
25.....	1.87	45	2.47	132	2.50	138	2.50	138
26.....	1.94	52	2.47	132	2.50	138	3.10	288
27.....	1.96	54	2.45	128	2.47	132	3.65	448
28.....	2.04	63	2.43	124	2.44	126	3.60	433
29.....	1.99	57	2.45	128	2.42	122	3.50	403
30.....	2.10	70	2.45	128	2.40	118	3.40	373
31.....	2.15	77			2.40	118		

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DAILY GAUGE HEIGHT AND DISCHARGE of Willow Creek near Macleod, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.35	358	1.53	19.8	1.50	18.0	1.45	15.5
2.....	3.20	316	1.50	18.0	1.50	18.0	1.45	15.5
3.....	3.16	305	1.50	18.0	1.48	17.0	1.45	15.5
4.....	3.09	285	1.48	17.0	1.45	15.5	1.45	15.5
5.....	2.40	118	1.45	15.5	1.45	15.5	1.45	15.5
6.....	2.35	109	1.43	14.5	1.45	15.5	1.50	18.0
7.....	2.33	105	1.40	13.0	1.45	15.5	1.53	19.8
8.....	2.30	100	1.38	12.2	1.43	14.5	1.40	24.0
9.....	2.25	92	1.35	11.0	1.43	14.5	1.65	28.0
10.....	2.23	89	1.70	31.0	1.40	13.0	2.05	64.0
11.....	2.20	84	1.80	39.0	1.40	13.0	2.60	160.0
12.....	2.17	80	1.86	44.0	1.40	13.0	2.65	172.0
13.....	2.17	80	1.79	38.0	1.40	13.0	2.65	172.0
14.....	2.15	77	1.72	33.0	1.38	12.2	2.65	172.0
15.....	2.10	70	1.64	27.0	1.46	16.0	2.65	172.0
16.....	2.05	64	1.59	23.0	1.58	23.0	2.80	207.0
17.....	2.05	64	1.59	23.0	1.65	28.0	2.96	249.0
18.....	2.00	58	1.59	23.0	1.70	31.0	3.00	260.0
19.....	1.90	48	1.74	34.0	1.75	35.0	3.10	288.0
20.....	1.75	35	2.05	64.0	1.75	35.0	3.00	260.0
21.....	1.75	35	1.75	35.0	1.70	31.0	2.80	207.0
22.....	1.75	35	1.75	35.0	1.78	37.0	2.80	207.0
23.....	1.75	35	1.80	39.0	1.78	37.0	2.74	193.0
24.....	1.60	24	2.23	89.0	1.75	35.0	2.56	151.0
25.....	1.60	24	2.10	70.0	1.73	33.0	2.53	145.0
26.....	1.55	21	1.95	53.0	1.60	24.0	2.40	118.0
27.....	1.55	21	1.82	41.0	1.60	24.0	2.38	114.0
28.....	1.55	21	1.68	30.0	1.55	21.0	2.35	109.0
29.....	1.55	21	1.60	24.0	1.53	19.8	2.35	109.0
30.....	1.55	21	1.53	19.8	1.45	15.5	2.30	100.0
31.....	1.55	21	1.50	18.0	.....	.....	2.25	92.0

MONTHLY DISCHARGE of Willow Creek near Macleod, for 1914.

(Drainage area 1,013 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (19-31).....	102	41.0	65	0.064	0.03	1,676
April.....	448	118.0	182	0.180	0.20	10,830
May.....	193	118.0	156	0.154	0.18	9,592
June.....	448	73.0	151	0.149	0.17	8,985
July.....	358	21.0	91	0.090	0.10	5,595
August.....	89	11.0	31	0.031	0.03	1,906
September.....	37	12.2	22	0.022	0.02	1,309
October.....	288	15.5	125	0.123	0.14	7,686
The period.....	.....	.....	.....	.....	0.87	47,579

MUDDYPOUND CREEK AT HART'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 27, Tp. 11, Rge. 28, W. 4th Mer., at the foot bridge on L. O. Hart's ranch.

Records available.—July 27, 1908, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 91.06 feet during 1908-1911; 90.06 feet during 1912-1914.

Bench-mark.—Permanent iron bench-mark 35 feet northeast of gauge; assumed elevation, 100.00 feet.

Channel.—Not liable to shift.

Discharge measurements.—Made from bridge at high water, and by wading at low water.

Observer.—Mrs. M. E. Hart.

DISCHARGE MEASUREMENTS of Muddypound Creek at Hart's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 1.....	F. R. Burfield.....	7.5	4.24	1.91	2.73	8.30
April 20.....	J. E. Caughey.....	8.0	4.00	1.32	2.23	5.30
May 6.....	do.....	6.5	2.58	0.86	2.11	2.20
May 27.....	do.....	5.5	1.45	0.61	2.02	0.88
June 18.....	do.....	3.5	0.65	0.35	1.95	0.23
July 3.....	do.....	3.5	0.65	0.38	1.95	0.25
July 17.....	do.....				1.80	Nil.
July 31.....	do.....				Dry.	"
Aug. 17.....	do.....				"	"
Sept. 16.....	do.....	5.0	1.70	0.56	2.02	0.95
Sept. 28.....	do.....				1.95	0.15
Oct. 19.....	do.....	6.0	2.30	1.31	2.12	3.00

DAILY GAUGE HEIGHT AND DISCHARGE of Muddypound Creek at Hart's Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.69	21.0	2.09	1.85	2.00	0.65
2.....	2.60	17.7	2.09	1.85	2.00	0.65
3.....	2.48	13.6	2.09	1.85	2.00	0.65
4.....	2.38	10.2	2.09	1.85	2.00	0.65
5.....	2.48	13.6	2.10	2.00	1.90	0.65
6.....	2.38	10.2	2.11	2.20	1.90	0.05
7.....	2.30	7.5	2.11	2.20	1.90	0.05
8.....	2.24	5.5	2.11	2.20	1.90	0.05
9.....	2.25	5.8	2.10	2.00	1.90	0.05
10.....	2.26	6.1	2.10	2.00	1.90	0.05
11.....	2.28	6.8	2.10	2.00	1.90	0.05
12.....	2.28	6.8	2.10	2.00	2.00	0.65
13.....	2.28	6.8	2.10	2.00	2.00	0.65
14.....	2.26	6.1	2.10	2.00	2.00	0.65
15.....	2.25	5.8	2.10	2.00	2.00	0.65
16.....	2.23	5.2	2.09	1.85	1.90	0.05
17.....	2.23	5.2	2.09	1.85	1.80	0.01
18.....	2.21	4.7	2.09	1.85	1.60	.....
19.....	2.21	4.7	2.09	1.85	1.50	.....
20.....	2.23	5.2	2.09	1.85	1.40	.....
21.....	2.23	5.2	2.09	1.85	1.30	.....
22.....	2.22	5.0	2.09	1.85	Dry.	Nil.
23.....	2.21	4.7	2.08	1.70	"	"
24.....	2.20	4.4	2.08	1.70	1.80	0.01
25.....	2.19	4.1	2.07	1.55	2.48	13.60
26.....	2.18	3.8	2.06	1.40	2.22	5.00
27.....	2.17	3.6	2.05	1.25	2.10	2.00
28.....	2.15	3.0	2.05	1.25	2.05	1.25
29.....	2.14	2.8	2.03	1.01	2.03	1.01
30.....	2.12	2.4	2.00	0.65	2.01	0.77
31.....			2.00	0.65		

DAILY GAUGE HEIGHT AND DISCHARGE of Muddypound Creek, at Hart's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.00	0.65	Dry.	Nil.	1.80	0.01	1.80	0.01
2.....	1.95	0.25	"	"	1.80	0.01	1.78	0.01
3.....	1.87	0.04	"	"	1.75	0.00	1.85	0.03
4.....	1.84	0.03	"	"			2.05	1.25
5.....	2.00	0.65	"	"			2.13	2.60
6.....	1.90	0.05	"	"	1.80	0.01	2.20	4.40
7.....	1.80	0.01	"	"	1.90	0.05	2.25	5.80
8.....	1.79	0.01	"	"	1.85	0.03	2.30	7.50
9.....	1.75	0.00	"	"	1.85	0.03	2.35	9.20
10.....	1.50		"	"	1.80	0.01	2.25	5.80
11.....	Dry.	Nil.	"	"	1.75	0.00	2.20	4.40
12.....	"	"	"	"	1.80	0.01	2.15	3.00
13.....	"	"	"	"	1.95	0.25	2.25	5.80
14.....	1.75	0.00	"	"	2.00	0.65	2.30	7.50
15.....	1.75	0.00	"	"	2.00	0.65	2.35	9.20
16.....	1.75	0.00	"	"	2.02	0.89	2.36	9.50
17.....	1.75	0.00	"	"	2.02	0.89	2.35	9.20
18.....	Dry.	Nil.	2.05	1.25	2.03	1.01	2.33	8.50
19.....	"	"	2.00	0.65	2.02	0.89	2.25	5.80
20.....	"	"	1.80	0.01	2.02	0.89	2.21	4.70
21.....	"	"	Dry.	Nil.	2.01	0.77	2.20	4.40
22.....	"	"	"	"	2.00	0.65	2.10	2.00
23.....	"	"	2.00	0.65	2.00	0.65	2.10	2.00
24.....	"	"	2.18	3.80	1.09		2.10	2.00
25.....	"	"	2.00	0.65	1.08		2.10	2.00
26.....	"	"	1.90	0.05	1.75	0.00	2.10	2.00
27.....	"	"	1.80	0.01	1.09		2.10	2.00
28.....	"	"	1.80	0.01	1.09		2.10	2.00
29.....	"	"	1.80	0.01	1.85	0.03	2.10	2.00
30.....	"	"	1.75	0.00	1.80	0.01	2.10	2.00
31.....	"	"	1.75	0.00			2.10	2.00

MONTHLY DISCHARGE of Muddypound Creek at Hart's Ranch, for 1914.

(Drainage area 44 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	21.00	2.40	6.90	0.157	0.180	411
May.....	2.20	0.65	1.75	0.040	0.050	108
June.....	13.60	0.01	1.00	0.023	0.020	60
July.....	0.65	Nil.	0.05	0.001	0.001	3
August.....	3.80	"	0.23	0.005	0.006	14
September.....	1.01	"	0.28	0.006	0.007	17
October.....	9.50	0.01	4.10	0.093	0.110	252
The period.....					0.374	865

TROUT CREEK AT LOCKWOOD'S RANCH.

Location.—On SE. $\frac{1}{4}$ Sec. 32, Tp. 11, Rge. 28, W. 4th Mer.

Records available.—July 7, 1911, to October 31, 1914.

Gauge.—Vertical staff; elevation 90.30 feet during 1911; 92.19 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of gravel.

Discharge measurements.—Made by wading.

Winter flow.—Station not maintained during the winter.

Observer.—Mrs. G. P. Stewart.

DISCHARGE MEASUREMENTS of Trout Creek at Lockwood's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 1.....	F. R. Burfield.....	43.0	25.4	1.60	4.34	41.0
April 20.....	J. E. Caughey.....	26.0	16.2	1.04	2.93	16.8
May 6.....	do.....	26.0	16.8	1.18	3.03	19.8
May 27.....	do.....	26.0	17.2	1.10	3.08	18.9
June 18.....	do.....	22.0	12.6	1.06	2.80	13.4
July 3.....	do.....	28.0	21.7	0.96	3.26	21.0
July 17.....	do.....	26.0	17.0	0.84	3.10	14.2
July 31.....	do.....	22.0	12.0	0.79	2.85	9.6
Aug. 17.....	do.....	24.0	14.4	0.79	2.95	11.4
Sept. 16.....	do.....	23.0	12.4	0.63	2.92	7.9
Sept. 28.....	do.....	24.0	13.6	0.37	2.95	5.0
Oct. 19.....	do.....	24.0	18.1	0.60	3.29	11.9

DAILY GAUGE HEIGHT AND DISCHARGE of Trout Creek at Lockwood's Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	4.34	41.0	2.91	16.7	2.95	16.0
2.....	4.34	41.0	2.90	16.3	2.95	16.0
3.....	4.32	41.0	3.02	19.5	2.95	16.0
4.....	4.32	42.0	3.05	20.5	2.94	15.8
5.....	4.40	42.0	3.00	19.0	3.02	18.0
6.....	4.36	42.0	3.04	19.8	3.00	17.5
7.....	4.33	43.0	3.04	19.8	2.96	16.6
8.....	4.30	43.0	3.04	19.7	2.95	16.4
9.....	4.27	43.0	3.06	20.0	2.93	16.0
10.....	4.17	44.0	3.06	20.0	2.87	14.6
11.....	3.89	44.0	3.06	20.0	2.96	16.7
12.....	3.97	47.0	3.06	19.8	2.96	16.7
13.....	4.10	50.0	3.04	19.8	2.98	17.4
14.....	4.03	48.0	3.04	19.6	3.02	18.5
15.....	4.08	50.0	3.05	19.6	2.95	16.7
16.....	4.00	48.0	3.06	19.7	2.84	14.2
17.....	3.88	44.0	3.06	19.8	2.82	13.7
18.....	3.87	44.0	3.06	19.8	2.80	13.3
19.....	3.40 ^a	30.0	3.08	20.0	2.78	13.4
20.....	2.92	16.8 ^b	3.14	22.0	2.77	12.7
21.....	2.90	16.0	3.14	22.0	2.76	12.6
22.....	2.88	16.0	3.09	20.0	2.75	12.5
23.....	2.88	15.6	3.09	20.0	2.77	12.7
24.....	2.91	16.5	3.05	18.0	2.77	12.7
25.....	2.95	17.5	3.04	18.7	3.82	42.0
26.....	2.92	17.0	3.04	18.4	3.38	26.0
27.....	2.92	16.8	3.04	18.9	3.12	18.7
28.....	2.96	17.8	3.04	17.8	3.14	18.8
29.....	2.96	17.8	3.04	17.8	3.12	18.0
30.....	2.93	17.0	3.01	17.2	3.14	18.2 ^c
31.....			2.98	16.7		

^a Gauge height interpolated.^b to ^c Shifting conditions.

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DAILY GAUGE HEIGHT AND DISCHARGE of Trout Creek at Lockwood's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.28	22.0a	2.85	9.6	2.79	6.2	3.00	6.0
2.....	3.28	21.0	2.85	9.6	2.79	6.2	3.00	6.0
3.....	3.25	21.0b	2.83	9.3	2.78	6.0	3.02	6.3
4.....	3.25	19.8	2.82	8.9	2.80	6.0	3.13	8.4
5.....	3.30	21.0	2.80	8.5	2.79	5.8	3.24	10.7
6.....	3.30	21.0	2.80	8.5	2.80	5.9	3.12	8.1
7.....	3.26	20.0	2.80	8.5	2.80	5.9	3.10	7.8
8.....	3.21	18.7	2.84	9.4	2.84	6.7	3.14	8.6
9.....	3.21	18.7	2.84	9.4	2.78	5.3	3.11	8.0
10.....	3.18	17.8	3.28	22.0	2.75	4.6	3.36	13.7
11.....	3.15	17.0	2.97	12.9	2.74	4.6	3.30	12.1
12.....	3.15	17.0	2.94	11.7	2.90	7.2	3.28	11.6
13.....	3.22	19.0	2.89	11.0	2.90	7.2	3.40	14.8
14.....	3.22	19.0	2.85	9.6	2.86	6.6	3.46	16.0
15.....	3.12	16.2	2.85	9.6	2.94	8.3	3.39	14.5
16.....	3.10	15.7	2.84	9.4	2.96	8.8	3.36	13.7
17.....	3.09	15.4	2.90	10.7c	2.94	7.5	3.36	13.7
18.....	3.09	15.4	3.07	13.2	2.89	6.6	3.34	13.1
19.....	3.06	14.7	2.92	10.5	2.90	6.5	3.34	13.1
20.....	3.04	14.1	2.86	8.7	2.89	5.9	3.32	12.6
21.....	3.03	13.9	2.84	8.7	2.86	5.0	3.30	12.1
22.....	3.01	13.4	2.83	8.2	2.85	4.6	3.24	10.7
23.....	2.99	12.9	3.28	19.5	2.85	4.3	3.24	10.7
24.....	2.95	11.9	3.14	15.4	2.85	4.0	3.22	10.2
25.....	2.95	11.9	2.93	10.0	2.84	3.8	3.22	10.2
26.....	2.94	11.7	2.86	8.3	2.86	4.0	3.21	10.0
27.....	2.96	12.2	2.84	7.8	2.98	5.8d	3.18	9.4
28.....	3.01	13.4	2.82	7.2	2.96	5.3	3.18	9.4
29.....	2.94	11.7	2.80	6.8	2.95	5.1	3.20	9.8
30.....	2.90	10.7	2.80	6.6	2.96	5.3	3.20	9.8
31.....	2.88	10.2	2.80	6.6	.....	.....	3.22	10.2

a to b and c to d Shifting conditions.

MONTHLY DISCHARGE of Trout Creek at Lockwood's Ranch, for 1914.

(Drainage area 164 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	50.0	15.6	33.70	0.206	0.23	2,005
May.....	22.0	16.3	19.30	0.117	0.13	1,187
June.....	42.0	12.5	16.90	0.103	0.11	1,606
July.....	22.0	10.2	16.10	0.098	0.11	990
August.....	22.0	6.6	10.20	0.062	0.07	627
September.....	8.8	3.8	5.83	0.036	0.04	347
October.....	16.0	6.0	10.70	0.065	0.07	658
The period.....	.....	.....	.....	.....	0.76	6,820

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Oldman River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
April 8.....	J. E. Caughey...	Bellevue Creek.....	NE. 29-7-3-5....	4.0	0.64	1.00	0.6400
April 24.....	do	do	do	2.4	0.88	1.10	0.9700
June 13.....	do	do	do	1.4	0.36	1.36	0.4900
July 8.....	do	do	do	1.7	0.51	1.22	0.6200
Aug. 6.....	do	do	do	3.0	0.90	1.01	0.9100
Aug. 20.....	do	do	do	<i>a</i>			0.6610
Sept. 3.....	do	do	do	<i>a</i>			0.6040
Sept. 21.....	do	do	do	<i>a</i>			0.8360
Oct. 6.....	do	do	do	<i>a</i>			0.7560
Oct. 26.....	do	do	do	<i>a</i>			2.7000
Mar. 23.....	F. R. Burfield...	Blairmore Creek...	SE. 3-8-4-5.....	6.0	3.50	0.76	2.7000
April 9.....	J. E. Caughey...	do	do	11.0	7.80	1.23	9.6000
April 25.....	do	do	do	21.5	22.60	2.92	66.0000
May 12.....	do	do	do	20.5	21.38	2.90	62.0000
June 13.....	do	do	do	21.0	13.55	1.94	26.0000
June 22.....	do	do	do	11.0	6.54	1.39	9.1000
July 8.....	do	do	do	9.0	4.70	1.10	5.2000
July 22.....	do	do	do	8.0	3.70	1.00	3.7000
Aug. 6.....	do	do	do	9.0	2.90	0.58	1.6800
Aug. 20.....	do	do	do	9.0	4.30	0.95	4.1000
Sept. 3.....	do	do	do	9.0	3.60	0.76	2.7000
Sept. 21.....	do	do	do	10.0	6.10	1.28	7.8000
Oct. 6.....	do	do	do	9.0	5.60	1.30	7.3000
Oct. 26.....	do	do	do	12.0	9.85	2.08	21.0000
April 1.....	do	Brocket Springs...	NE. 6-7-28-4....			<i>b</i>	0.0046
July 14.....	R. H. Goodchild	Chafin Creek.....	NE. 6-13-2-5....			<i>a</i>	0.2200
July 14.....	do	Dago Creek.....	NW. 17-13-2-5....			<i>a</i>	1.2390
Aug. 14.....	do	do				<i>a</i>	1.2400
Jan. 17.....	R. Palmer.....	Drum Creek.....	NW. 18-7-3-5....	8.0	2.80	0.55	1.5500
Feb. 6.....	do	do	do	8.0	2.31	0.51	1.1800
Feb. 16.....	E. W. W. Hughes	do	do	7.5	3.07	0.53	1.6200
Mar. 6.....	do	do	do	7.5	2.86	0.52	1.4900
Mar. 20.....	F. R. Burfield...	do	do	6.5	2.22	0.72	2.5000
April 8.....	J. E. Caughey...	do	do	4.5	2.05	1.07	2.5000
April 24.....	do	do	do	8.0	8.00	1.77	15.8000
May 12.....	do	do	do	12.0	2.95	1.75	5.2000
June 13.....	do	do	do	8.0	2.20	1.50	3.3000
June 22.....	do	do	do	8.0	2.30	1.48	3.4000
July 8.....	do	do	do	9.0	2.35	1.06	2.5000
July 22.....	do	do	do	7.0	2.30	0.96	2.2000
Aug. 6.....	do	do	do	6.0	2.10	1.22	2.6000
Aug. 20.....	do	do	do	7.0	2.80	0.98	2.8000
Sept. 3.....	do	do	do	5.0	2.20	1.43	3.1000
Sept. 21.....	do	do	do	7.0	3.00	0.97	2.9000
Oct. 6.....	do	do	do	9.0	4.80	1.26	6.0000
Nov. 12.....	do	do	do	9.0	3.50	1.26	4.4000
Dec. 4.....	do	do	do	8.0	3.30	1.05	3.5000
Dec. 28.....	do	do	do	8.0	2.90	0.93	2.7000
Aug. 31.....	R. H. Goodchild.	Ernst Creek.....	NW. 26-10-3-5....			<i>a</i>	0.9190
Feb. 18.....	E. W. W. Hughes	Fortier N. Spring..	SE. 17-7-1-5....	<i>c</i>	6895	<i>e</i>	0.0128
Mar. 10.....	F. R. Burfield...	do	do		2995		0.0056
Mar. 24.....	do	do	do		2578		0.0048
April 14.....	J. E. Caughey...	do	do		2260		0.0042
April 29.....	do	do	do		2045		0.0038
May 16.....	do	do	do		2420		0.0045
June 2.....	do	do	do		646		0.0012
July 25.....	do	do	do		1346		0.0025
Aug. 12.....	do	do	do		2207		0.0041
Sept. 9.....	do	do	do		7934		0.0147
Sept. 24.....	do	do	do		2476		0.0046
Oct. 15.....	do	do	do		5436		0.0101
Nov. 2.....	do	do	do		4090		0.0076
Nov. 19.....	do	do	do		3357		0.0062
Dec. 9.....	do	do	do		3660		0.0068
Dec. 29.....	do	do	do		4200		0.0078
Feb. 18.....	E. W. W. Hughes	Fortier S. Spring..	SE. 17-7-1-5....		969		0.0018
Mar. 10.....	F. R. Burfield...	do	do		969		0.0018
Mar. 24.....	do	do	do		969		0.0018
April 14.....	J. E. Caughey...	do	do		1900		0.0035
April 29.....	do	do	do		2110		0.0039
May 16.....	do	do	do		1728		0.0032
June 2.....	do	do	do		1045		0.0019
July 10.....	do	do	do		915		0.0017
July 25.....	do	do	do		700		0.0013
Aug. 12.....	do	do	do		753		0.0014
Aug. 26.....	do	do	do		915		0.0017
Sept. 9.....	do	do	do		1076		0.0020
Sept. 24.....	do	do	do	<i>d</i>	915	<i>f</i>	0.0017

a Weir measurements.*c* to *d* Imperial gals. per 24 hours.*e* to *f* Discharge determined by standard measures.

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MISCELLANEOUS DISCHARGE MEASUREMENTS made in Oldman River drainage basin in 1914.

—Concluded.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft per sec.</i>	<i>Sec.-ft.</i>
Oct. 15....	J. E. Caughey...	Fortier S. Spring	SE. 17-7-1-5....	.....<i>c</i>	915	.....<i>e</i>	0.0017
Nov. 19....	do	do	do	.....	1291	.....	0.0024
Dec. 9....	do	do	do	.....	1844	.....	0.0034
Dec. 29....	do	do	do	.....<i>d</i>	3014	.....<i>f</i>	0.0056
Mar. 21....	F. R. Burfield...	Gold Creek.....	SE. 30-7-3-5....	19.5	14.05	0.91	12.7000
April 8....	J. E. Caughey...	do	do	21.5	15.60	0.90	14.1000
April 24....	do	do	do	22.0	23.40	1.83	43.0000
May 12....	do	do	do	22.0	26.60	2.21	59.0000
June 13....	do	do	do	21.4	21.45	1.77	38.0000
June 22....	do	do	do	26.0	21.20	1.32	28.0000
July 8....	do	do	do	22.0	20.80	1.42	30.0000
July 22....	do	do	do	20.0	17.40	1.36	24.0000
Aug. 6....	do	do	do	20.0	16.40	1.11	18.2000
Aug. 20....	do	do	do	22.0	20.40	1.29	26.0000
Sept. 3....	do	do	do	22.0	18.40	1.23	23.0000
Sept. 21....	do	do	do	21.0	18.40	1.13	21.0000
Oct. 6....	do	do	do	21.0	18.70	1.06	19.8000
Mar. 23....	F. R. Burfield...	Lyon Creek.....	SE. 35-7-4-5....	5.0	1.39	0.52	0.7200
April 9....	J. E. Caughey...	do	do	13.5	7.97	0.93	7.4000
April 25....	do	do	do	26.0	21.40	3.24	69.0000
June 13....	do	do	do	8.0	3.90	1.74	6.8000
July 8....	do	do	do	7.0	2.63	0.76	2.0000
July 22....	do	do	do	.....	.....	.....	Nil.
Aug. 6....	do	do	do	.....	.....	.....	Nil.
Aug. 21....	do	do	do	11.0	7.80	0.61	4.7000
Sept. 4....	do	do	do	.....	.....	.....	Nil.
Sept. 22....	do	do	do	9.0	4.20	1.46	6.1000
Oct. 5....	do	do	do	13.0	10.60	0.67	7.1000
Oct. 26....	do	do	do	15.0	13.60	1.22	16.6000
Mar. 7....	E. W. W. Hughes	Nez-Perce Creek	SE. 17-8-4-5....	3.0	1.30	1.00	1.3000
Mar. 20....	F. R. Burfield...	do	do	4.5	2.24	0.34	0.7600
April 8....	J. E. Caughey...	do	do	7.0	2.25	0.94	2.1000
April 24....	do	do	do	14.0	12.30	1.97	24.0000
May 13....	do	do	do	14.2	13.04	2.17	28.0000
June 15....	do	do	do	13.2	6.59	0.96	6.4000
June 23....	do	do	do	12.0	6.30	0.81	5.1000
July 9....	do	do	do	12.5	4.23	0.98	4.1000
July 23....	do	do	do	5.0	1.30	1.30	1.6900
Aug. 7....	do	do	do	4.0	1.21	1.16	1.4100
Aug. 21....	do	do	do	5.0	1.90	0.91	1.7300
Sept. 4....	do	do	do	4.0	1.00	1.17	1.1700
Sept. 22....	do	do	do	6.0	3.10	1.23	3.8000
Oct. 7....	do	do	do	6.0	2.60	0.89	2.3000
July 6....	R. H. Goodchild.	Spring Creek....	NE. 9-5-1-5....	.....	.....	.....<i>a</i>	0.0510
July 15....	do	do	SW. 30-13-2-5....	.....	.....	.....<i>a</i>	0.3540
July 16....	do	do	NE. 23-13-2-5....	.....	.....	.....<i>a</i>	0.1030
July 16....	do	do	SE. 23-13-2-5....	.....	.....	.....<i>a</i>	0.2220
July 20....	do	Spring	NE. 13-14-30-4....	.....	.....	.....<i>a</i>	0.0500
Mar. 23....	F. R. Burfield...	York Creek.....	NW. 30-7-4-5....	6.0	4.17	0.69	2.8000
April 9....	J. E. Caughey...	do	do	9.5	6.97	1.72	12.0000
April 25....	do	do	do	22.0	20.30	2.30	47.0000
May 12....	do	do	do	23.0	22.25	2.54	57.0000
June 13....	do	do	do	22.0	20.50	2.08	43.0000
June 22....	do	do	do	20.0	16.90	1.82	31.0000
July 8....	do	do	do	21.0	15.00	1.68	25.0000
July 22....	do	do	do	20.0	12.40	1.29	16.1000
Aug. 6....	do	do	do	8.0	4.30	1.34	5.8000
Aug. 20....	do	do	do	20.0	11.20	1.19	13.4000
Sept. 3....	do	do	do	7.0	4.40	0.96	4.2000
Sept. 21....	do	do	do	16.0	16.30	1.43	23.0000
Oct. 26....	do	do	do	26.0	18.00	1.08	19.4000

a Weir measurements.

b Capacity measurement.

c to *d* Imperial gals. per 24 hours.

e to *f* Discharge determined by standard measures.

WATERTON RIVER DRAINAGE BASIN.

General Description.

Waterton River rises in the northwestern portion of the state of Montana, on the eastern slope of the Rocky Mountains. It flows in a northerly direction and, passing through a chain of lakes near the international boundary, known as Waterton Lakes, it continues in a north and easterly direction and finally empties into Belly River, near Stand Off, Alta.

The topography of the basin is of a varied character, ranging from the mountainous regions of Montana to the rolling prairie of southern Alberta. The tributaries are mostly in the upper portion of the basin, near the international boundary and from the west side.

There is a large snowfall in the upper portion of the basin, and the melting of this, combined with heavy rains, often causes big floods on this river in the early summer. Thereafter the river steadily decreases in volume, until the minimum is reached about mid-winter.

Waterton Lakes offer a very favourable site for a storage reservoir, approximately fourteen miles long and one mile wide. The steep, rocky banks of the narrows is an ideal site for the construction of a dam. The flow could be more than doubled during the summer months and used for irrigation purposes, or a power project could easily be developed.

WATERTON RIVER AT WATERTON MILLS.

Location.—On the NE. $\frac{1}{4}$ Sec. 8, Tp. 2, Rge. 29, W. 4th Mer., near Waterton Mills.

Records available.—August 26, 1908, to December 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 4,153.07 feet during 1908-12; 4,152.87 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark, located within six feet of the gauge; elevation, 4,152.87 feet above mean sea level (Irrigation Surveys datum).

Channel.—Composed of rocks, stone and gravel; not liable to shift.

Discharge measurements.—Made from a cable car at ordinary stages, and by wading at very low stages.

Winter flow.—The high velocity prevents a complete ice cover at the gauge during the winter, and open water measurements are obtained.

Observer.—H. H. Hanson.

Remarks.—In view of obtaining more accurate measurements, the cable was moved from the NE. $\frac{1}{4}$ Sec. 8, Tp. 2, Rge. 29, W. 4th Mer., to SW. $\frac{1}{4}$ Sec. 21, Tp. 2, Rge. 29, W. 4th Mer., in November, 1914. The channel at this point is straight for about 300 feet above and 300 feet below the cable. The bed of the stream consists of small stones and gravel, and is not liable to shift.

DISCHARGE MEASUREMENTS of Waterton River at Waterton Mills, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 4.	J. E. Degnan.	104	105.0	1.34	2.28	141
Jan 15.	do.	152	135.0	1.35	2.53	183
Jan. 28.	do.	55	81.8	1.93	2.53	158
Feb. 13.	do.	51	80.0	1.79	2.32	144
Mar. 8.	do.	102	99.8	1.12	2.20	111
Apr. 3.	O. H. Hoover.	45	80.9	1.68	2.56	135
Apr. 16.	do.	283	297.0	1.80	3.17	536
May 7.	do.	293	501.0	3.00	3.92	1,506
May 28.	do.	294	596.0	3.21	4.23	1,913
June 16.	do.	296	633.0	3.76	4.35	2,383
July 6.	do.	289	491.4	2.69	3.87	1,322
Aug. 1.	do.	281	266.0	1.62	3.07	431
Aug. 22.	do.	286	309.0	1.84	3.23	568
Sept. 12.	do.	212	187.0	1.34	2.76	252
Nov. 5.	do.	144	446.0	1.70	3.54	741
Nov. 19.	do.	136	365.0	1.42	3.36	502
Dec. 2.	do.	136	340.0	1.14	3.12	378
Dec. 21.	do.	130	293.0	0.86	2.61	174

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DAILY GAUGE HEIGHT AND DISCHARGE of Waterton River at Waterton Mills, for 1914.

Day.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.23	116	2.48	165	2.23	116	2.57	189	3.64	1,012	4.13	1,820
2.....	2.22	114	2.47	163	2.30	129	2.56	186	3.73	1,135	4.32	2,212
3.....	2.26	122	2.46	161	2.46	161	2.57	189	4.03	1,637	4.53	2,606
4.....	2.29	127	2.42	152	2.45	158	2.58	192	4.06	1,694	4.64	2,908
5.....	2.32	133	2.39	146	2.43	154	2.64	211	4.08	1,732	4.63	2,886
6.....	2.65	131 ^a	2.36	140	2.30	129	2.69	227	4.05	1,675	4.52	2,644
7.....	2.30	129	2.36	140	2.18	109	2.70	230	4.03	1,637	4.34	2,254
8.....	2.27	124	2.38	144	2.19	110	2.71	234	3.88	1,368	4.35	2,275
9.....	2.34	137	2.39	146	2.16	106	2.74	247	3.94	1,472	4.20	1,970
10.....	2.40	148	2.41	150	2.17	107	2.76	256	4.03	1,637	3.96	1,508
11.....	2.49	167	2.39	146	2.18	109	2.80	273	4.05	1,675	3.86	1,336
12.....	2.65	214	2.36	140	2.18	109	2.90	323	4.06	1,694	3.81	1,256
13.....	2.63	208	2.32	133	2.19	110	3.01	392	4.11	1,790	4.05	1,675
14.....	2.58	192	2.33	135	2.25	120	3.15	488	4.19	1,950	4.33	2,233
15.....	2.53	178	2.34	137	2.33	135	3.23	551	4.17	1,910	4.36	2,296
16.....	2.52	175	2.36	140	2.31	131	3.17	503	4.30	2,170	4.36	2,296
17.....	2.51	172	2.31	131	2.29	127	3.31	620	4.40	2,880	4.35	2,275
18.....	2.50	169	2.28	125	2.28	125	3.38	690	4.43	2,446	4.51	2,622
19.....	2.49	167	2.25	120	2.29	127	3.43	746	4.45	2,490	4.43	2,446
20.....	2.48	165	2.23	116	2.30	129	3.50	830	4.43	2,446	4.36	2,296
21.....	2.50	169	2.22	115	2.33	135	3.61	973	4.37	2,317	4.30	2,170
22.....	2.53	178	2.24	118	2.32	133	3.65	1,025	4.33	2,233	4.32	2,212
23.....	2.52	175	2.26	122	2.33	135	3.69	1,077	4.30	2,170	4.05	1,675
24.....	2.51	172	2.28	125	2.35	138	3.72	1,120	4.35	2,275	3.95	1,490
25.....	2.51	172	2.29	127	2.37	142	3.73	1,135	4.43	2,446	3.93	1,454
26.....	2.52	175	2.18	109	2.36	140	3.72	1,120	4.41	2,402	3.92	1,436
27.....	2.52	175	2.18	109	2.34	137	3.72	1,120	4.32	2,212	3.91	1,418
28.....	2.52	175	2.19	110	2.37	142	3.70	1,090	4.24	2,050	3.89	1,384
29.....	2.51	172	.....	.....	2.41	150	3.68	1,064	4.15	1,870	3.88	1,368
30.....	2.50	169	.....	.....	2.43	154	3.65	1,025	4.06	1,694	3.84	1,304
31.....	2.49	167	.....	.....	2.42	152	.....	.....	4.05	1,675	.....	.....

^a Ice jam—discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Waterton River at Waterton Mills, for 1914.

—Concluded.

Day.	July.		August.		September.		October.		November. ^a		December. ^a	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	3.83	1,288	3.08	439	3.12	467	3.18	510	3.38	690	2.58	156
2.....	3.85	1,320	3.06	425	3.04	412	3.20	525	3.35	630	3.14	385
3.....	3.84	1,304	3.05	419	2.96	360	3.25	568	3.46	710	3.02	318
4.....	3.81	1,256	3.04	412	2.97	366	3.30	610	3.51	734	3.30	503
5.....	3.86	1,336	3.03	405	2.92	335	3.24	559	3.54	734	3.00	308
6.....	3.87	1,352	3.01	392	2.89	318	3.32	630	3.61	806	2.95	288
7.....	3.84	1,304	2.99	379	2.88	313	3.31	620	3.59	782	2.88	256
8.....	3.81	1,256	2.96	360	2.88	313	3.27	585	3.56	734	2.85	243
9.....	3.78	1,210	2.93	342	2.92	335	3.29	602	3.52	806	2.82	230
10.....	3.74	1,150	2.94	348	2.88	313	3.26	576	3.50	660	2.79	224
11.....	3.70	1,090	2.91	329	2.85	298	3.26	576	3.45	610	2.76	214
12.....	3.65	1,025	2.90	323	2.76	256	3.27	585	3.43	585	2.73	204
13.....	3.61	973	2.89	318	2.78	264	3.30	610	3.44	593	2.79	224
14.....	3.64	1,012	2.87	308	2.80	273	3.34	650	3.55	690	2.73	208
15.....	3.58	934	2.86	303	2.78	264	3.53	869	3.37	525	2.69	195
16.....	3.55	895	2.85	298	2.80	273	3.68	1,064	3.35	503	2.51	150
17.....	3.52	856	2.99	379	2.83	288	3.83	1,288	3.32	481	2.40	129
18.....	3.50	830	3.18	510	2.83	288	3.93	1,454	3.30	459	2.30	113
19.....	3.48	806	3.23	551	2.90	323	3.92	1,436	3.35	496	2.21	101
20.....	3.47	794	3.23	551	3.02	398	3.92	1,436	3.27	445	2.12	93
21.....	3.46	782	3.23	551	3.13	474	3.90	1,400	3.19	392	2.55	161
22.....	3.33	640	3.23	551	3.16	496	3.85	1,320	3.14	366	2.55	163
23.....	3.30	610	3.20	525	3.20	525	3.78	1,210	3.09	335	2.54	163
24.....	3.27	585	3.22	542	3.22	542	3.71	1,105	3.15	373	2.49	154
25.....	3.24	559	3.21	534	3.23	551	3.64	1,012	3.18	398	2.47	152
26.....	3.20	525	3.19	518	3.24	559	3.57	921	3.02	303	2.45	150
27.....	3.17	503	3.17	503	3.26	576	3.50	830	3.02	303	2.46	154
28.....	3.13	474	3.12	467	3.26	576	3.47	794	3.02	308	2.42	148
29.....	3.12	467	3.11	459	3.23	551	3.44	758	3.02	308	2.40	146
30.....	3.11	459	3.09	445	3.20	525	3.41	722	3.05	323	2.44	156
31.....	3.09	445	3.12	467	.....	.....	3.39	700	.....	.....	2.43	154

^a Slight ice conditions during November and December.

MONTHLY DISCHARGE of Waterton River at Waterton Mills, for 1914.

(Drainage area 214 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	214	114	161	0.752	0.87	9,900
February.....	165	109	134	0.626	0.65	7,442
March.....	161	106	131	0.612	0.70	8,055
April.....	1,135	186	611	2.850	3.18	36,357
May.....	2,490	1,012	1,913	8.940	10.31	117,626
June.....	2,908	1,256	1,993	9.310	10.39	118,589
July.....	1,352	445	905	4.230	4.88	55,646
August.....	551	298	431	2.010	2.32	26,501
September.....	576	256	394	1.840	2.05	23,445
October.....	1,454	510	856	4.000	4.61	52,633
November.....	806	303	536	2.500	2.79	31,894
December.....	503	93	201	0.939	1.08	12,350
The year.....	.....	.....	.....	.....	43.83	500,447

SESSIONAL PAPER No. 25c

CROOKED CREEK NEAR WATERTON MILLS.

Location.—On the SW. $\frac{1}{4}$ Sec. 22, Tp. 2, Rge. 29, W. 4th Mer.

Records available.—September 15, 1909, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 89.48 feet during 1913-14. For previous gauge data, refer to previous reports.

Bench-mark.—Permanent iron bench-mark located on the left bank, 25 feet from the gauge; assumed elevation, 100.00 feet.

Channel.—Consists of sand, gravel and small stones; not liable to shift.

Discharge measurements.—Made by wading.

Winter flow.—No records are kept after October 31.

Observer.—Frank Rowe.

DISCHARGE MEASUREMENTS of Crooked Creek near Waterton Mills, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 2.	O. H. Hoover.	12.6	11.40	1.34	2.90	15.4
April 15.	do.	16.9	22.00	1.58	2.26	35.0
May 8.	do.	17.6	24.60	1.70	2.36	42.0
May 29.	do.	16.8	20.40	1.67	2.15	28.0
June 18.	do.	16.5	17.80	1.24	2.05	22.0
Aug. 25.	do.	9.2	4.67	2.17	1.78	10.1
Sept. 11.	do.	6.4	1.88	1.71	1.55	3.2
Sept. 26.	do.	7.2	2.69	1.78	1.66	4.8
Nov. 5.	do.	16.8	17.50	0.94	2.01	16.5

DAILY GAUGE HEIGHT AND DISCHARGE of Crooked Creek near Waterton Mills, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			1.99	18.7	2.07	23.0
2.			2.00	19.2	2.10	25.0
3.			2.05	22.0	2.11	26.0
4.			2.21	32.0	2.09	24.0
5.			2.29	37.0	2.15	28.0
6.			2.34	41.0	2.17	29.0
7.			2.35	42.0	2.11	26.0
8.	1.71	7.3	2.35	42.0	2.04	22.0
9.	1.80	10.4	2.37	43.0	2.00	19.2
10.	1.77	9.3	2.65	63.0	1.97	17.8
11.	1.83	11.6	2.51	53.0	1.93	15.8
12.	2.07	23.0	2.34	41.0	1.90	14.4
13.	2.12	26.0	2.29	37.0	2.37	43.0
14.	2.05	22.0	2.24	34.0	2.54	55.0
15.	2.00	19.2	2.24	34.0	2.39	44.0
16.	2.21	32.0	2.24	34.0	2.28	37.0
17.	2.05	22.0	2.24	34.0	2.10	25.0
18.	2.01	19.8	2.24	34.0	2.05	22.0
19.	2.06	23.0	2.24	34.0	2.02	20.0
20.	2.32	39.0	2.34	41.0	1.98	18.2
21.	2.25	35.0	2.34	41.0	1.94	16.3
22.	2.19	30.0	2.28	37.0	1.93	15.8
23.	2.14	27.0	2.25	35.0	1.91	14.9
24.	2.15	28.0	2.23	33.0	1.99	18.7
25.	2.05	22.0	2.23	33.0	2.35	42.0
26.	2.03	21.0	2.22	32.0	2.40	45.0
27.	2.00	19.2	2.19	30.0	2.23	33.0
28.	2.10	25.0	2.16	29.0	2.10	25.0
29.	2.06	23.0	2.14	27.0	2.11	26.0
30.	2.01	19.8	2.11	26.0	2.09	24.0
31.			2.09	24.0		

DAILY GAUGE HEIGHT AND DISCHARGE OF CROOKED CREEK near Waterton Mills, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1	1.99	18.7	1.53	2.8	1.59	4.1	1.67	6.2
2	1.98	18.2	1.52	2.6	1.58	3.9	1.69	6.7
3	1.89	14.0	1.50	2.2	1.58	3.9	1.89	14.0
4	1.86	12.8	1.47	1.8	1.56	3.5	1.84	12.0
5	2.02	20.0	1.47	1.8	1.56	3.6	1.77	9.3
6	1.95	16.8	1.49	2.0	1.56	3.5	1.89	14.0
7	1.89	14.0	1.49	2.0	1.56	3.5	1.82	11.2
8	1.85	12.4	1.49	2.0	1.68	6.5	1.90	14.4
9	1.82	11.2	1.51	2.4	1.67	6.2	1.95	16.8
10	1.80	10.4	1.58	3.9	1.67	6.2	1.89	14.0
11	1.79	10.1	1.53	2.8	1.55	3.2	1.84	12.0
12	1.86	12.8	1.51	2.4	1.58	3.9	1.95	16.8
13	1.74	8.3	1.49	2.0	1.63	5.0	2.77	71.0
14	1.76	9.0	1.47	1.8	1.69	6.7	2.78	72.0
15	1.71	7.3	1.46	1.6	1.70	7.0	2.81	74.0
16	1.71	7.3	1.46	1.6	1.73	8.0	2.86	77.0
17	1.69	6.7	1.70	7.0	1.86	12.8	2.77	71.0
18	1.67	6.2	1.96	17.3	1.71	7.3	2.65	63.0
19	1.64	5.4	1.74	8.4	1.69	6.7	2.50	52.0
20	1.63	5.1	1.73	8.0	1.74	8.3	2.50	52.0
21	1.61	4.6	1.68	6.5	1.76	9.0	2.24	34.0
22	1.61	4.6	1.64	5.4	1.73	8.0	2.26	35.0
23	1.61	4.6	1.64	5.4	1.68	6.5	2.09	24.0
24	1.60	4.3	1.79	10.1	1.68	6.5	2.07	23.0
25	1.59	4.1	1.78	9.7	1.68	6.5	2.04	22.0
26	1.57	3.7	1.68	6.5	1.67	6.2	2.02	20.0
27	1.56	3.5	1.66	5.9	1.67	6.2	2.00	19.2
28	1.55	3.2	1.64	5.4	1.66	5.9	1.98	18.2
29	1.55	3.2	1.64	5.4	1.66	5.9	1.96	17.3
30	1.55	3.2	1.58	3.9	1.68	6.5	1.93	15.8
31	1.54	3.0	1.60	4.3			1.92	15.4

MONTHLY DISCHARGE OF CROOKED CREEK near Waterton Mills, for 1914.

(Drainage area 26 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (8-30)	39.0	7.30	22.0	0.846	0.72	1,004
May	63.0	18.70	35.0	1.350	1.56	2,152
June	55.0	14.40	26.0	1.000	1.12	1,547
July	20.0	3.00	8.7	0.335	0.39	535
August	17.3	1.60	4.7	0.181	0.21	289
September	12.8	3.20	6.0	0.231	0.26	357
October	77.0	6.20	30.0	1.150	1.33	1,845
The period.					5.59	7,729

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MISCELLANEOUS DISCHARGE MEASUREMENTS made in Waterton River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Aug. 24.....	O. H. Hoover...	Berta Creek.....	Waterton Lakes..	7.8	5.06	1.44	7.3
June 17.....	do	Blakiston Brook...	NE. 30-1-29-4....	27.9	64.28	5.88	378.0
July 4.....	do	do	do	40.8	59.30	3.32	197.0
Aug. 3.....	do	do	SE. 30-1-29-4....	28.0	20.70	2.10	43.0
Aug. 22.....	do	do	Waterton Lakes..	34.0	39.50	3.31	131.0
Sept. 11.....	do	do	do	27.7	26.10	1.60	42.0
Aug. 4.....	do	Cottonwood Creek..	20-2-29-4.....	23.5	7.14	0.77	5.5
Aug. 4.....	do	do N. Br.	29-2-29-4.....	8.6	2.43	0.97	2.4
Aug. 4.....	do	Foothill Creek.....	11-5-29-4.....	17.4	18.09	1.19	21.0
Aug. 24.....	do	Hellroaring Creek..	Waterton Lake....	18.2	8.17	1.28	10.4
June 17.....	do	Oil Creek.....	NE. 30-1-29-4....	65.0	80.20	2.93	235.0
July 4.....	do	do	do	48.0	64.50	2.17	140.0
Aug. 3.....	do	do	NW. 23-1-30-4....	22.0	24.70	1.62	40.0
Aug. 24.....	do	do	Waterton Lake....	32.3	45.30	1.42	66.0
Aug. 4.....	do	Pine Creek.....	33-3-29-4.....	11.4	8.55	1.10	9.4
Aug. 4.....	do	Yarrow Creek.....	14-4-29-4.....	29.6	20.20	1.20	24.0

BELLY RIVER DRAINAGE BASIN.

General Description.

Belly River rises near Chief Mountain, in northern Montana. The main stream is augmented on the United States side of the boundary line by Middle Fork, and on the Canadian side by North Fork. From the junction with North Fork, in Sec. 21, Tp. 1, Rge. 28, W. 4th Mer., the river flows in a winding northeasterly course until it is joined by Oldman River in Sec. 27, Tp. 9, Rge. 23, W. 4th Mer., where it turns southeasterly, and after making a loop, flows in a north and easterly direction until it joins Bow River in Sec. 27, Tp. 11, Rge. 13, W. 4th Mer., and forms the South Saskatchewan River.

The topography of the basin is of the most varied character, ranging from the mountainous regions of Montana and the rolling prairie and foothills at the boundary to the level prairie which extends from Lethbridge to the junction with the Bow River. The upper tributaries drain a forested region; the main stream flows through a deep valley with many clumps of large white-wood on its banks.

There is an abundant snowfall in the upper portion of the basin, but the precipitation diminishes into semi-arid conditions near Lethbridge. At first, Belly River is a comparatively clear stream, but soon after crossing the boundary line it gradually becomes turbid, especially at the times of high water. The greater portion of the sediment is caused by the washing away of banks and cutting of new channels. Freshets caused by melting snow and heavy rains are frequent in the summer. The maximum flow usually occurs in June or July, and after that the flow gradually decreases until it reaches the minimum in January or February.

As yet very little use has been made of the water in this basin. In the upper regions, where water could easily be diverted, it is not required for irrigation purposes, and farther downstream it would be an expensive undertaking.

There are a couple of small private irrigation schemes diverting water from this river, and the city of Lethbridge receives its domestic supply from the same source.

The Alberta Railway and Irrigation Company have located and may construct a canal from Belly River to supply their irrigation system, if St. Mary River is found deficient. A survey and estimate of the cost of this proposed canal were made by the government during 1912, and a copy of the report may be seen in the report of the Commissioner of Irrigation for 1912. There are also a number of feasible power sites in the upper regions which will no doubt be developed when there is a market.

BELLY RIVER NEAR MOUNTAIN VIEW.

Location.—On the NE. $\frac{1}{4}$ Sec. 5, Tp. 2, Rge. 28, W. 4th Mer., at John West's ranch.

Records available.—November 1, 1911, to December 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 4,344.90 feet during 1911-14.

Bench-mark.—Permanent iron bench-mark, located on the right bank at the station; elevation 4,356.74 above mean sea level (Irrigation Surveys datum).

Channel.—Composed of gravel and sand; not liable to shift on account of the rocky control about 200 feet downstream.

Discharge measurements.—Made from a cable car for all open water measurements.

Winter flow.—Winter records are obtained about 100 feet above the cable.

Observer.—J. N. West.

DISCHARGE MEASUREMENTS of Belly River near Mountain View, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 5.....	J. E. Degnan.....	55.0	102.0	0.93	2.21	95
Jan. 16.....	do.....	55.0	102.0	0.82	1.98	84
Jan. 30.....	do.....	54.0	67.7	0.74	1.90	50
Feb. 12.....	do.....	55.0	91.0	0.76	2.52	69
Mar. 9.....	do.....	54.0	91.7	0.65	1.81	59
April 1.....	O. H. Hoover.....	47.4	60.3	1.25	1.66	75
April 15.....	do.....	86.0	214.0	1.09	2.20	233
May 8.....	do.....	92.0	256.0	1.89	2.73	485
May 27.....	do.....	96.0	305.0	2.65	3.24	808
June 15.....	do.....	99.0	341.0	3.64	3.69	1,243
July 7.....	do.....	96.0	295.0	2.52	3.18	744
July 28.....	do.....	88.0	229.0	1.48	2.47	339
Aug. 19.....	do.....	90.0	242.0	1.69	2.63	411
Sept. 10.....	do.....	83.5	195.0	0.86	2.04	168
Oct. 21.....	do.....	92.0	266.0	1.90	2.80	506
Nov. 20.....	do.....	83.0	204.0	0.93	2.13	191
Dec. 2.....	do.....	84.0	204.0	0.82	2.12	168
Dec. 22.....	do.....	56.0	142.6	0.64	2.42	92

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Mountain View, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.12	93a	1.93	56	1.70	65	1.75	75	2.60	400	3.40	958
2.....	2.12	91	2.04	56	1.80	64	1.63	76	2.90	582	3.55	1,082
3.....	2.08	91	2.05	55	1.90	63	1.63	77	3.31	884	3.76	1,260
4.....	2.12	93	2.04	53	2.00	62	1.66	78	3.20	798	3.75	1,251
5.....	2.16	95	2.05	54	1.80	62	1.79	79	3.00	652	3.65	1,166
6.....	2.00	96	2.15	58	1.80	61	1.79	78	2.92	596	3.44	991
7.....	2.13	94	2.30	62	1.90	60	1.74	78	2.81	523	3.10	724
8.....	2.14	92	2.40	66	1.80	59	1.75	78	2.73	463	3.02	666
9.....	2.08	89	2.40	66	1.83	59	1.79	81	2.93	603	2.90	582
10.....	2.07	87	2.42	67	1.60	60	1.83	100a	2.97	631	2.74	479
11.....	2.07	86	2.40	68	1.70	61	1.89	126	3.00	652	2.74	479
12.....	2.10	88	2.52	69	1.85	62	1.94	141	3.05b	688	2.75	486
13.....	2.00	88	2.53	70	1.90	63	2.06	176	3.10b	724	3.80	1,294
14.....	2.02	86	2.15	71	1.90	64	2.14	204	3.16	768	3.89	1,370
15.....	2.00	85	2.10	72	1.85	65	2.19	221	3.12	739	3.69	1,200
16.....	1.98	84	2.05	72	1.90	65	2.35	283	3.35	917	3.52	1,057
17.....	2.00	82	2.05	72	1.90	65	2.40	304	3.61	1,132	3.54	1,074
18.....	2.05	80	2.00	71	1.93	65	2.35	283	3.63	1,150	3.56	1,090
19.....	2.00	78	2.00	70	1.75	65	2.45	327	3.56	1,090	3.52	1,057
20.....	1.95	74	1.95	69	1.80	66	2.60	409	3.47	1,015	3.50	1,040
21.....	1.95	71	2.00	67	1.65	67	2.70	455	3.44	991	3.15	761
22.....	2.04	66	1.95	65	1.70	68	2.65	428	3.22	814	3.10	724
23.....	2.07	61	1.90	63	1.67	68	2.66	433	3.16	768	3.05	688
24.....	2.08	58	2.00	63	1.65	67	2.74	479	3.36	925	3.08	710
25.....	2.25	56	1.84	64	1.57	67	2.73	473	3.52	1,057	3.05	688
26.....	2.25	61	1.70	65	1.90	67	2.70	455	3.47	1,015	3.00	652
27.....	2.27	64	1.70	66	2.00	68	2.62	411	3.52	1,057	2.95	617
28.....	2.34	62	1.60	67	1.95	69	2.65	428	3.18	783	2.94	610
29.....	2.35	60	.....	.....	1.85	73	2.60	400	3.04	681	2.98	638
30.....	1.91	50	1.82	75	2.55	375	3.00	652	3.00	652
31.....	1.93	52	1.72	75	3.40	958

a to a Ice conditions.

b Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Mountain View, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.96	624	2.47	336	2.10	190	2.25	243	2.36	287	2.16	175
2.....	3.00	652	2.47	336	2.05	174	2.24	239	2.40	304	2.01	168
3.....	3.04	681	2.46	332	2.04	171	2.43	318	2.61	406	2.10	165
4.....	3.10	724	2.46	332	2.03	168	2.40	304	2.62	411	2.10	162
5.....	3.20	798	2.48	341	2.03	168	2.39	300	2.64	422	2.08	153
6.....	3.20	798	2.42	313	2.02	164	2.37	291	2.67	438	2.07	141
7.....	3.19	791	2.42	313	2.02	164	2.36	287	2.60	400	2.10	132
8.....	3.14	754	2.36	287	2.02	164	2.33	275	2.51	355	2.36	124
9.....	3.09	717	2.28	254	2.01 ^a	161	2.34	279	2.43	318	2.45	121
10.....	3.05	688	2.25	243	2.01	161	2.30	262	2.43	318	2.58	119
11.....	2.96	624	2.23	235	2.01	161	2.27	251	2.44	322	2.64	117
12.....	2.96	624	2.20	224	2.02	164	2.21	228	2.44 ^b	313	2.75	115
13.....	2.95	617	2.20	224	2.01	161	2.26	247	2.37	282	2.76	116
14.....	2.96	624	2.18	217	2.01	161	2.53	365	2.35	270	2.77	115
15.....	2.90	582	2.18	217	2.03	168	2.97	631	2.19	253	2.78	110
16.....	2.86	556	2.17	214	2.04	171	3.15	761	2.10	243	2.78	101
17.....	2.81	523	2.20	224	2.06	177	3.26	845	2.30	247	2.64	103
18.....	2.70	455	2.70	455	2.20	224	3.13	746	2.20	240	2.48	100
19.....	2.66	433	2.63	416	2.44	322	3.05	688	2.15	223	2.45	94
20.....	2.65	428	2.55	375	2.56	380	2.98	638	2.12	207	2.45	87
21.....	2.60	400	2.48	341	2.60	400	2.80	516	2.11	193	2.47	89
22.....	2.57	385	2.40	304	2.50	350	2.70	455	2.11	187	2.47	92
23.....	2.55	375	2.36	287	2.46	332	2.57	385	2.12	190	2.44	98
24.....	2.53	365	2.36	287	2.44	322	2.50	350	2.12	198	2.42	102
25.....	2.50	350	2.36	287	2.43	318	2.44	322	2.15 ^c	207	2.38	100
26.....	2.48	341	2.30	262	2.42	313	2.40	304	2.10	199	2.35	95
27.....	2.48	341	2.25	243	2.40	304	2.35	283	2.07	180	2.17	90
28.....	2.47	336	2.24	239	2.40	304	2.32	270	2.09	187	2.20	86
29.....	2.48	341	2.24	239	2.36	287	2.30	262	2.08 ^d	184	2.11	81
30.....	2.47	336	2.18	217	2.31	266	2.28	254	2.13	179	2.27 ^d	77
31.....	2.46	332	2.14	204	.....	.....	2.30	262	.....	.....	2.12	77

^a Gauge height interpolated.^b to ^c Ice conditions.^d to ^d Ice conditions.

MONTHLY DISCHARGE of Belly River near Mountain View, for 1914.

(Drainage area 121 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	96	52	78	0.645	0.744	4,796
February.....	72	53	65	0.537	0.559	3,610
March.....	75	59	65	0.537	0.619	3,997
April.....	479	75	253	2.090	0.233	15,055
May.....	1,150	400	797	6.590	7.600	49,006
June.....	1,370	479	868	7.170	8.090	51,650
July.....	798	332	535	4.420	5.100	32,896
August.....	455	204	284	2.350	2.710	17,462
September.....	400	161	232	1.920	2.140	13,805
October.....	845	228	383	3.170	3.660	23,550
November.....	438	179	272	2.250	2.510	16,185
December.....	175	77	113	0.934	1.080	6,948
The year.....	.....	.....	.....	.....	34.955	238,960

MAMI CREEK NEAR MOUNTAIN VIEW.

Location.—On the NE. $\frac{1}{4}$ Sec. 18, Tp. 2, Rge. 27, W. 4th Mer.

Records available.—August 13, 1909, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 93.06 feet during 1909-14.

Bench-marks.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of stones covered with sand and gravel; not liable to shift.

Discharge measurements.—Made by wading.

Winter flow.—Records are discontinued after October 31.

Observer.—C. H. Findlay.

DISCHARGE MEASUREMENTS of Mami Creek near Mountain View, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 1.....	O. H. Hoover.....	5.6	2.13	1.20	3.41	2.60
May 9.....	do.....	14.0	9.73	2.05	2.42	19.90
May 30.....	do.....	11.3	5.07	1.67	2.14	6.20
June 13.....	do.....	12.0	6.28	1.30	2.25	8.20
July 3.....	do.....	9.3	2.85	0.78	2.00	2.20
Aug. 1.....	do.....	.....	.....	<i>a</i>	1.82	0.23
Aug. 21.....	do.....	.....	.....	<i>a</i>	1.90	0.60
Sept. 10.....	do.....	.....	.....	<i>a</i>	1.85	0.35
Sept. 29.....	do.....	.....	.....	<i>a</i>	1.86	0.45
Oct. 21.....	do.....	12.7	6.81	1.42	2.22	9.70
Nov. 6.....	do.....	11.6	5.07	0.99	2.13	5.00

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Mami Creek near Mountain View, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	.....	.....	2.19	7.0	2.13	5.0
2.....	.....	.....	2.20	7.4	2.13	5.0
3.....	.....	.....	2.21	7.8	2.13	5.0
4.....	.....	.....	2.23	8.7	2.14	5.3
5.....	.....	.....	2.29	11.5	2.14	5.3
6.....	.....	.....	2.37	16.4	2.18	6.7
7.....	.....	.....	2.44	21.3	2.16	6.0
8.....	.....	.....	2.41	19.2	2.14	5.3
9.....	.....	.....	2.42	19.9	2.14	5.3
10.....	.....	.....	2.48	24.0	2.14	5.3
11.....	.....	.....	2.50	26.0	2.12	4.8
12.....	.....	.....	2.40	18.5	2.10	4.2
13.....	.....	.....	2.36	15.7	2.12	4.8
14.....	.....	.....	2.35	15.0	2.16	6.0
15.....	.....	.....	2.32	13.2	2.18	6.7
16.....	.....	.....	2.29	11.5	2.16	6.0
17.....	2.24	9.1	2.26	10.0	2.14	5.3
18.....	2.24	9.1	2.23	8.7	2.13	5.0
19.....	2.30	12.0	2.23	8.7	2.13	5.0
20.....	2.35	15.0	2.35	15.0	2.13	5.0
21.....	2.31	12.6	2.30	12.0	2.11	4.5
22.....	2.29	11.5	2.28	11.0	2.09	3.9
23.....	2.24	9.1	2.27	10.5	2.08	3.7
24.....	2.22	8.2	2.26	10.0	2.08	3.7
25.....	2.22	8.2	2.25	9.5	2.13	5.0
26.....	2.20	7.4	2.24	9.1	2.29	11.5
27.....	2.20	7.4	2.18	6.7	2.27	10.5
28.....	2.22	8.2	2.16	6.0	2.25	9.5
29.....	2.23	8.7	2.16	6.0	2.20	7.4
30.....	2.21	7.8	2.14	5.3	2.15	5.6
31.....	2.13	5.0

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DAILY GAUGE HEIGHT AND DISCHARGE of Mami Creek near Mountain View, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec. ft.	Feet.	Sec.-ft.
1.....	2.10	4.20	1.96	1.36	1.91	0.80	1.88	0.58
2.....	2.08	3.70	1.90	0.70	1.90	0.70	1.90	0.70
3.....	2.08	3.70	1.83	0.32	1.88	0.58	1.90	0.70
4.....	2.08	3.70	1.81	0.24	1.90	0.70	1.93	1.00
5.....	2.10	4.20	1.80	0.30	1.90	0.70	1.98	1.68
6.....	2.09	3.90	1.79	0.18	1.90	0.70	2.08	3.70
7.....	2.08	3.70	1.78	0.16	1.98	1.68	2.08	3.70
8.....	2.08	3.70	1.80	0.20	2.00	2.00	2.08	3.70
9.....	2.00	2.00	1.88	0.58	2.00	2.00	2.08	3.70
10.....	2.00	2.00	1.88	0.58	1.96	1.36	2.08	3.70
11.....	1.99	1.84	1.88	0.58	1.96	1.36	2.08	3.70
12.....	1.99	1.84	1.88	0.58	1.98	1.68	2.08	3.70
13.....	1.99	1.84	1.87	0.52	2.00	2.00	2.08	3.70
14.....	2.00	2.00	1.86	0.46	1.96	1.36	2.13	5.00
15.....	2.00	2.00	1.85	0.40	1.98	1.68	2.15	5.60
16.....	2.00	2.00	1.84	0.36	1.99	1.84	2.18	6.70
17.....	2.00	2.00	2.01	2.20	1.99	1.84	2.20	7.40
18.....	2.00	2.00	2.02	2.40	1.99	1.84	2.23	8.70
19.....	2.00	2.00	2.04	2.70	1.99	1.84	2.25	9.50
20.....	2.00	2.00	1.98	1.68	1.99	1.84	2.28	11.00
21.....	2.00	2.00	1.95	1.20	1.98	1.68	2.26	10.00
22.....	2.00	2.00	1.90	0.70	1.98	1.68	2.23	8.70
23.....	2.00	2.00	2.03	2.50	1.96	1.36	2.20	7.40
24.....	2.00	2.00	2.02	2.40	1.93	1.00	2.18	6.70
25.....	2.00	2.00	2.00	2.00	1.90	0.70	2.17	6.30
26.....	2.00	2.00	1.97	1.52	1.89	0.64	2.16	6.00
27.....	1.99	1.84	1.90	0.70	1.88	0.58	2.15	5.60
28.....	1.99	1.84	1.89	0.64	1.88	0.58	2.14	5.30
29.....	1.98	1.68	1.89	0.64	1.88	0.58	2.14	5.30
30.....	1.97	1.52	1.89	0.64	1.88	0.58	2.14	5.30
31.....	1.96	1.36	1.89	0.64	.....	.....	2.14	5.30

MONTHLY DISCHARGE of Mami Creek near Mountain View, for 1914.

(Drainage area 22 square miles).

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF.	
	Maximum	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (17-30).....	15 0	7.40	9.60	0.436	0.23	266
May.....	26.0	5.00	12.10	0.550	0.63	744
June.....	11.5	3.70	5.70	0.259	0.29	339
July.....	4.2	1.36	2.40	0.110	0.13	148
August.....	2.7	0.16	0.97	0.044	0.05	60
September.....	2 0	0.58	1.38	0.063	0.07	82
October.....	11 0	0.58	5.20	0.236	0.27	320
The period.....	.....	.....	.....	.....	1.67	1,959

CHRISTIANSON DITCH NEAR MOUNTAIN VIEW.

Location.—On the SE. $\frac{1}{4}$ Sec. 12, Tp. 3, Rge. 28, W. 4th Mer.

Records available.—May 17, 1913, to July 1, 1913. One discharge measurement only in 1914.

Gauge.—Plain staff; elevation of zero 96.04 feet.

Bench-mark.—Wooden stake, left bank; assumed elevation, 100.00 feet.

Observer.—No observations in 1914.

DISCHARGE MEASUREMENTS of Christianson Ditch near Mountain View, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 18	O. H. Hoover	5.5	3.41	0.57	1.62	1.94

BELLY RIVER NEAR STAND OFF.

Location.—On the SE. $\frac{1}{4}$ Sec. 21, Tp. 6, Rge. 25, W. 4th Mer., near Stand Off.

Records available.—May 27, 1909, to December 31, 1914.

Gauge.—Chain gauge from bank; zero of gauge maintained at 92.51 feet during 1909-12; 91.82 feet during 1913; 90.82 feet during 1914.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of clean gravel and small stones; not liable to shift.

Discharge measurements.—Made by wading at low stages, and from the traffic bridge on the NE. $\frac{1}{4}$ Sec. 21, Tp. 6, Rge. 25, W. 4th Mer., at high stages.

Winter flow.—Measurements through the ice are made at a point 150 feet below the chain gauge.

Observer.—George Pearson.

DISCHARGE MEASUREMENTS of Belly River near Stand Off, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 26	R. Palmer	35.0	65.2	0.93	1.44	58
Feb. 26	E. W. W. Hughes	41.0	58.1	1.06	2.33	61
March 13	F. R. Burfield	53.0	61.2	1.67	1.60	107
March 28	O. H. Hoover	47.0	91.3	1.03	2.25	94
April 13	do	72.0	106.0	2.15	2.50	228
May 5	do	92.0	260.0	3.29	3.50	858
May 21	do	92.3	280.0	3.44	3.70	964
June 11	do	85.7	202.5	2.78	3.13	563
July 9	do	90.9	233.0	3.45	3.39	701
Aug. 6	do	86.0	167.0	2.11	2.79	352
Aug. 31	do	74.0	111.0	2.15	2.57	238
Sept. 14	do	67.5	94.5	1.66	2.37	157
Nov. 16	do	88.0	153.0	1.04	2.84	159
Dec. 5	do	86.0	103.0	0.72	2.88	74
Dec. 18	do	34.0	40.1	1.83	1.35	73

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Stand Off, for 1914.

DAY.	January.		February.		March.		April.		May.		June	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.89	143	1.19	59	2.09	63	2.45	188	3.08	526	3.49	798
2.....	1.89	144	1.19	52	2.09	64	2.45	188	3.15	569	3.55	843
3.....	1.89	145	1.19	43	2.04	64	2.35	146	3.41	740	3.80	1,043
4.....	1.89	147	1.21	38	1.97	65	2.25	108	3.65	921	4.15	1,338
5.....		145	1.22	31	1.94	68	2.28	119	4.45	1,604	4.10	1,295
6.....		140	1.24	29	1.88	72	2.30	126	4.00	1,210	3.90	1,126
7.....		132	1.19	36	1.83	77	2.30	126	3.50	805	3.66	929
8.....		122	1.19	44	1.73	83	2.32	134	3.00	478	3.55	843
9.....		113	1.29	49		83	2.34	142	3.15	569	3.31	672
10.....		110	1.29	50		83	2.35	146	3.46	776	3.16	575
11.....		107	1.29	46		87	2.39	163	3.50	805	3.11	544
12.....		105	1.41	46		94	2.39	163	3.35	699	3.15	569
13.....		106	1.94	51		107	2.60	258	3.15	569	3.15	569
14.....		106	2.32	55		115	2.70	310	3.16	575	4.15	1,338
15.....		105	2.33	60	2.15	114	2.85	392	3.55	843	4.05	1,252
16.....		103	2.29	67	2.20	112	2.89	414	3.66	929	3.96	1,176
17.....		98	2.29	63	2.20	111	2.90	420	3.75	1,002	3.81	1,051
18.....		88		57	2.25	109	2.90	420	3.95	1,168	3.95	1,168
19.....		72		53	2.25	107	3.00	478	3.86	1,093	3.81	1,051
20.....		55		47	2.25	106	3.11	544	3.76	1,010	3.79	1,035
21.....		45	2.29	41	2.30	105	3.20	600	3.70	961	3.67	937
22.....		51	2.32	42	2.30	103	3.21	606	3.60	881	3.56	851
23.....		55	2.29	45	2.30	101	3.20	600	3.62	897	3.42	747
24.....		55	2.30	48	2.25	98	3.18	588	3.62	897	3.39	726
25.....		57	2.30	53		95	3.15	569	3.89	1,118	3.36	706
26.....	1.44	58	2.33	61		92	3.15	569	3.89	1,118	3.36	706
27.....	1.44	56	2.25	62		93	3.15	569	3.76	1,010	3.34	692
28.....	1.44	48	2.10	62	2.45	94	3.13	557	3.65	921	3.34	692
29.....	1.19	47			2.45	120	3.10	538	3.58	866	3.34	692
30.....	1.19	58			2.50	165	3.08	526	3.41	740	3.34	692
31.....	1.19	65			2.47	180			3.40	733		

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Stand Off, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	3.32	679	2.79	359	2.50	210	2.76	342	2.86	398	3.18	137
2.....	3.32	679	2.79	359	2.50	210	2.76	342	2.98	466	3.08	122
3.....	3.32	679	2.79	359	2.49	206	2.76	342	2.96	455	2.98	97
4.....	3.38	719	2.79	359	2.49	206	2.76	342	2.96	455	.....	83
5.....	3.46	776	2.77	348	2.48	201	2.77	348	2.96	455	.....	74
6.....	3.58	866	2.75	337	2.46	193	2.77	348	2.92	432	2.88	72
7.....	3.56	850	2.73	326	2.45	189	2.78	353	2.87	403	2.71	72
8.....	3.44	762	2.69	305	2.44	184	2.74	332	2.83	381	2.61	72
9.....	3.39	726	2.65	284	2.42	176	2.73	326	2.78	353	2.53	73
10.....	3.36	706	2.65	284	2.40	167	2.68	300	2.78	353	2.47	74
11.....	3.33	685	2.60	258	2.39	163	2.66	289	2.73	326	2.38	75
12.....	3.28	652	2.60	258	2.37	155	2.72	321	2.71	315	2.32	79
13.....	3.25	632	2.58	248	2.36	151	2.80	364	2.63	274 _a	.....	75
14.....	3.12	550	2.57	241	2.36	151	2.85	392	2.78	235	.....	75
15.....	3.10	538	2.55	234	2.40	167	2.90	420	3.13	178	.....	75
16.....	3.08	526	2.53	224	2.45	189	3.50	805	2.98	159	.....	76
17.....	3.05	508	2.76	342	2.50	210	3.70	961	2.98	155	.....	75
18.....	3.05	508	2.76	342	2.52	220	3.60	881	2.98	151	1.31	73
19.....	3.03	496	3.00	478	2.56	259	3.60	881	2.93	148	1.55	71
20.....	3.02	490	3.05	508	2.75	337	3.39	726	2.90	145	1.65	72
21.....	3.00	478	2.95	449	2.85	392	3.30	665	2.84	142	1.65	74
22.....	3.00	478	2.90	420	2.90	420	3.18	588	2.77	135	1.65	75
23.....	2.98	466	2.82	375	2.90	420	3.00	478	2.71	130	1.65	75
24.....	2.97	462	2.79	359	2.85	392	2.94	443	2.71	126	1.65	72
25.....	2.96	455	2.75	337	2.83	381	2.90	420	2.68	123	1.65	68
26.....	2.94	443	2.70	310	2.80	364	2.80	364	2.68	122	1.65	66
27.....	2.93	437	2.60	258	2.78	353	2.75	337	2.68	121	1.60	70
28.....	2.85	392	2.58	248	2.76	342	2.73	326	2.68	122	1.60	72
29.....	2.79	359	2.57	244	2.76	342	2.70	310	3.32	127	1.60	74
30.....	2.79	359	2.57	244	2.76	342	2.68	300	3.33	138	1.63	75
31.....	2.79	359	2.55	234	.....	.....	2.67	294	.....	.....	1.65	77 _a

a to a Ice conditions.

MONTHLY DISCHARGE of Belly River near Stand Off, for 1914.

(Drainage area 461 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	147	45	93	0.202	0.23	5,718
February.....	67	29	50	0.108	0.11	2,777
March.....	180	63	98	0.213	0.25	6,026
April.....	606	108	357	0.774	0.86	21,243
May.....	1,604	478	872	1.890	2.18	53,617
June.....	1,338	544	888	1.930	2.15	52,840
July.....	866	359	571	1.240	1.43	35,109
August.....	508	224	320	0.694	0.80	19,676
September.....	420	151	256	0.555	0.62	15,233
October.....	961	289	450	0.976	1.12	27,669
November.....	466	121	251	0.544	0.61	14,936
December.....	137	66	78	0.169	0.19	4,796
The year.....	10.55	259,639

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BELLY RIVER NEAR LETHBRIDGE.

Location.—On the NW. $\frac{1}{4}$ Sec. 1, Tp. 9, Rge. 22, W. 4th Mer.*Records available.*—August 31, 1911, to December 31, 1914.*Gauge.*—Chain gauge located on traffic bridge; zero of gauge maintained at 87.82 feet during 1911-12; 85.70 feet during 1913-14.*Bench-mark.*—Top of arrow marked with white paint on the right abutment; assumed elevation, 100.00 feet.*Discharge measurements.*—Made from downstream side of the traffic bridge.*Winter flow.*—Obtained through the ice one-half mile below the traffic bridge.*Observer.*—Wm. Bedster.

DISCHARGE MEASUREMENTS of Belly River near Lethbridge, in 1914.

Date.		Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan.	10.	J. E. Degnan.	195	583	1.22	2.75	708
Jan.	21.	do	193	511	1.30	2.49	654
Feb.	3.	do	188	503	1.33	2.85	618
Feb.	18.	do	180	561	1.09	2.77	605
March	4.	do	189	742	1.40	2.99	1,043
April	4.	J. E. Caughey.	325	1,271	1.28	2.58	1,623
March	22.	do	367	2,026	2.57	4.76	5,209
May	9.	do	380	2,467	2.65	5.34	6,536
May	29.	do	415	2,789	3.01	6.20	8,401
June	19.	do	424	2,952	3.04	6.37	8,965
July	6.	do	373	2,347	2.48	5.20	5,807
July	20.	do	353	1,740	1.73	3.70	3,013
Aug.	3.	do	336	1,498	1.44	3.01	2,149
Aug.	18.	do	300	1,330	1.18	2.65	1,569
Aug.	31.	do	231	1,376	1.33	2.80	1,833
Sept.	17.	do	292	1,242	1.08	2.40	1,343
Sept.	30.	do	339	1,513	1.36	3.06	2,072
Oct.	22.	do	370	2,290	2.46	5.23	5,639
Nov.	11.	O. H. Hoover.	361	1,876	1.91	3.96	3,579
Nov.	25.	do	356	1,745	1.84	3.68	3,213
Dec.	10.	do	315	1,181	0.61	2.56	720
Dec.	28.	do	175	831	1.58	4.39	1,316

DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Lethbridge, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	2.55	620 ^a	...	630	2.97	898	2.55	1,585	4.60	4,880	5.71	6,947
2.	2.55	625	...	620	2.97	954	2.49	1,508	4.75	5,200	6.08	8,028
3.	2.45	690	2.86	618	2.89	962	2.55	1,585	4.95	5,645	6.52	9,514
4.	2.90	732	2.73	605	3.10	1,043	2.45	1,460	5.95	8,285	7.01	11,442
5.	2.85	720	2.70	594	2.90	1,075	2.52	1,546	6.19	9,085	7.22	12,324
6.	2.89	730	2.63	586	2.69	1,106	2.62	1,676	5.95	8,285	7.00	11,400
7.	2.93	740	2.59	580	2.60	1,132	3.22	2,488	5.72	7,598	6.55	9,625
8.	2.87	730	2.57	570	2.53	1,158	3.11	2,334	5.36	6,630	6.25	8,575
9.	...	720	2.56	562	2.28	1,181	2.79	1,897	5.34	6,536 ^b	5.75	7,055
10.	2.80	708	2.53	560	2.35	1,207	2.75	1,845	5.43	6,760	5.55	6,530
11.	2.67	681	2.63	562	3.27	1,222	2.78	1,884	6.14	8,840	5.35	6,030
12.	2.66	680	2.70	565	2.25	1,260	2.54	1,572	6.15	8,840	5.23	5,749
13.	2.69	685	2.74	570	2.28	1,298	3.00	2,180	6.00	8,320	5.16	5,592
14.	2.67	690	2.71	577	2.35	1,330	3.50	2,900	5.78	7,640	5.33	5,982
15.	2.71	694	2.91	583	2.45	1,370	3.76	3,322	6.04	8,400	6.54	9,588
16.	2.79	700	...	590	2.65	1,417	3.90	3,560	6.34	9,400	6.35	8,910
17.	2.72	680	...	588	2.55	1,393 ^a	4.22	4,136	6.74	10,880	6.30	8,710
18.	2.77	692	2.77	605	2.37	1,364	4.20	4,100	6.94	11,680	6.33	8,842
19.	2.67	680	2.79	610	2.35	1,340	4.13	3,974	6.91	11,520	6.37	8,978
20.	2.61	662	2.87	618	2.31	1,292	4.00	3,740	6.86	11,240	6.35	8,910
21.	2.55	654	2.90	630	2.22	1,184	4.86	5,442	6.77	10,840	6.16	8,282
22.	2.45	646	2.95	643	2.14	1,088	4.77	5,244	6.53	9,840	6.02	7,842
23.	2.36	644	2.89	645	2.11	1,052	4.76	5,222	6.41	9,340	5.78	7,136
24.	2.35	639	2.90	662	2.21	1,172	4.72	5,134	6.30	8,960	5.35	6,030
25.	2.45	635	2.93	686	2.09	1,029	4.77	5,244	6.60	10,000	5.30	5,910
26.	2.54	628	3.00	732	2.07	1,007	4.97	5,691	6.80	10,740	5.41	6,175
27.	2.55	624	3.03	783	1.39	290	4.87	5,464	6.62	10,040	5.91	7,510
28.	2.55	612	3.00	840	1.48	380	4.81	5,332	6.34	8,920	6.04	7,904
29.	2.67	602	...	...	1.67	570	4.77	5,244	6.04	8,401 ^b	5.45	6,275
30.	2.85	615	...	...	2.47	1,484	4.68	5,048	5.80	7,190	5.35	6,030
31.	3.00	638	2.51	1,533	5.67	6,842

a to *a* Ice conditions.*b* to *b* Shifting conditions.

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DAILY GAUGE HEIGHT AND DISCHARGE of Belly River near Lethbridge, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	5.22	5,726	2.90	1,920	2.69	1,668	2.95	1,980	3.91	3,305	3.00	2,040
2.....	5.13	5,526	3.05	2,105	2.62	1,584	2.90	1,920	3.92	3,320	2.80	1,890
3.....	5.00	5,240	3.01	2,053	2.58	1,538	2.79	1,788	3.94	3,350	2.63	1,596
4.....	5.00	5,240	2.82	1,824	2.53	1,483	3.11c	2,183	4.03	3,488	2.80	1,800
5.....	5.10	5,460	2.70	1,680	2.46	1,406	3.43c	2,622	4.13	3,648	2.74	1,728a
6.....	5.20	5,680	2.62	1,584	2.38	1,318	3.75	3,070	4.21	3,777	2.49b	1,370
7.....	5.25	5,795	2.53	1,483	2.39	1,329	4.25	3,845	4.28	3,896	1.86	1,060
8.....	5.13	5,526	2.40	1,340	2.42	1,362	3.55	2,790	4.26	3,862	1.82	870
9.....	4.88	4,990	2.57	1,527	2.52	1,472	3.53	2,762	4.14	3,664	1.83	760
10.....	4.80	4,830	2.71	1,692	2.38	1,318	3.50	2,720	4.14	3,664	2.56	720
11.....	4.80	4,830	2.50	1,549	2.38	1,318	3.54	2,776	3.96	3,380	2.50	708
12.....	4.53	4,334	2.50	1,450	2.36	1,296	3.61	2,874	3.88	3,290	2.50	704
13.....	4.40	4,100	2.41	1,351	2.32	1,252	3.53	2,762	3.90	3,290	2.95	715
14.....	4.45	4,190	2.36	1,296	2.33	1,263	3.52	2,748	3.98	3,410	2.53	730
15.....	4.35	4,015	2.25	1,175	2.34	1,274	4.00	3,410	3.08	2,144	2.63	752
16.....	4.33	3,981	2.20	1,120	2.29	1,219	5.13	5,526	2.80	1,800	4.005	794
17.....	4.30	3,930	2.55	1,505	2.42	1,362	5.75	7,055	2.70	1,680	4.00	835
18.....	4.00	3,440	2.64	1,608	2.37	1,307	5.92	7,540	3.08	2,144	3.98	840
19.....	3.88	3,260	3.78	3,112	2.36	1,296	6.05	7,935	3.25	2,370	3.95	840
20.....	3.70	3,000	3.74	3,056	2.50	1,450	5.75	7,055	3.62	2,888	3.90	858
21.....	3.55	2,790	3.49	2,706	2.79	1,788	5.65	6,790	3.80	3,140	4.00	900
22.....	2.50	2,720	3.36	2,524	3.08	2,144	5.25	5,795	3.65	2,930	4.06	960
23.....	3.43	2,622	3.33	2,482	3.33	2,482	4.95	5,135	3.63	2,902	4.05	998
24.....	3.30	2,440	3.31	2,454	3.15	2,235	4.75	4,735	3.64	2,916	4.03	993
25.....	3.18	2,274	3.33	2,482	3.09	2,157	4.56	4,388	3.70	3,000	4.01	1,000
26.....	3.07	2,131	3.31	2,454	3.05	2,105	4.39	4,083	3.60	2,860	4.27	1,025
27.....	3.05	2,105	3.21	2,314	3.01	2,053	4.19	3,744	3.51	2,734	4.32	1,260
28.....	2.96	1,992	3.15	2,235	2.95	1,980	4.15	3,680	3.40	2,580	4.17	1,316
29.....	2.90	1,920	2.93	1,956	2.96	1,992	4.08	3,568	3.22	2,328	4.15	1,320
30.....	2.86	1,872	2.85	1,860	2.99	2,028	3.93	3,335	3.07	2,131	4.13	1,315
31.....	2.82	1,824	2.73	1,716	.....	.....	3.93	3,335	.....	.....	4.00	1,305a

a to a Ice conditions.

b to b Gauge height of top of ice.

c Gauge height interpolated.

MONTHLY DISCHARGE of Belly River near Lethbridge, for 1914.

(Drainage area 6,764 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	740	602	671	0.099	0.11	41,258
February.....	840	560	622	0.092	0.10	34,544
March.....	1,484	290	1,122	0.166	0.19	68,992
April.....	5,691	1,460	3,412	0.505	0.56	203,028
May.....	11,680	4,880	8,606	1.270	1.46	529,162
June.....	12,324	5,592	7,928	1.170	1.30	471,750
July.....	5,795	1,824	3,799	0.562	0.65	233,580
August.....	3,112	1,120	1,923	0.284	0.33	118,243
September.....	2,482	1,219	1,616	0.239	0.27	96,160
October.....	7,935	1,788	3,990	0.591	0.68	245,889
November.....	3,896	1,680	2,995	0.443	0.49	178,215
December.....	2,040	704	1,094	0.162	0.19	67,268
The year.....	.....	.....	.....	.....	6.33	2,288,098

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Belly River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Oct. 23....	O. H. Hoover...	North Branch of Belly River....	16-1-28-4.....	67.3	53.80	1.43	77 00
Oct. 23....	do ...	West Branch of Belly River....	Glacier Nat. Park	48.8	50.20	3.01	151.00
Oct. 23....	do ...	South Branch of Belly River....	do	54.0	59.80	1.99	119.00
June 15....	do ...	J. N. West's ditch.	NW. 2-2-28-4...	4.0	2.45	0.63	1.55

ST. MARY RIVER DRAINAGE BASIN.

General Description.

St. Mary River, an important tributary of the Belly River and thus indirectly of the South Saskatchewan River, heads in northern Montana on the eastern slope of the main range of the Rocky Mountains. It starts from the great Blackfoot glacier and receives affluents from numerous lesser glaciers. These streams unite within a short distance from their source and flow into Upper St. Mary Lake. Below this lake and in close proximity is Lower St. Mary Lake, the aggregate lengths of the two being about 22 miles. The river flows out of the lower lake at an elevation of 4,460 feet above mean sea level, and takes a northerly course through the foothills to the international boundary. From the boundary it flows in a north and easterly direction through a rolling country, finally emptying into the Belly River near Lethbridge, Alta.

The basin is bounded on the south by the Rocky Mountains, on the west by the watershed between Belly and St. Mary Rivers, and on the east by the watershed between Milk and St. Mary Rivers. The upper portion of the basin is heavily timbered, and receives its precipitation mostly in the shape of snowfall; the lower and major portion is totally devoid of tree growth and has a small precipitation.

The river flows through a very deep valley having steep banks, making the diversion of water from this stream for irrigation an expensive undertaking. In Canada the Alberta Railway and Irrigation Company has water rights on this river. The headgates of their canal is at Kimball, five miles north of the boundary, and they already have 231 miles of ditch constructed, which irrigates land surrounding Lethbridge.

As this is an international river, discharge measurements are taken on it by the Hydro-metric Surveys branches of both the Canadian and American Governments. The hydro-metric engineers of both countries use a common gauging station near Kimball.

FIDLER BROTHERS' DITCH FROM BOUNDARY CREEK.

Location.—On the SE. $\frac{1}{4}$ Sec. 19, Tp. 1, Rge. 26, W. 4th Mer.

Records available.—September 13, 1911, to July 13, 1914.

Gauge.—Vertical staff.

Bench-mark.—Wooden plug on the left bank, eight feet west of the gauge; elevation, 3 90 feet above zero of the gauge.

Channel.—Consists of sand and clay.

Discharge measurements.—Made by current meter.

Observer.—Jos. Fidler.

DISCHARGE MEASUREMENTS of Fidler Brothers' Ditch from Boundary Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 12.....	O. H. Hoover.....	4.6	2 00	1.32	1.51	2 6
July 2	do	4.8	2.03	1.23	1.46	2 5

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DAILY GAUGE HEIGHT AND DISCHARGE OF Fidler Brothers' Ditch from Boundary Creek, for 1914.

DAY.	June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1			1.45	2.4
2			1.46	2.5
3	1.50	2.6	1.46	2.5
4	1.50	2.6	1.47	2.5
5	1.49	2.6	1.47	2.5
6	1.49	2.6	1.49	2.6
7	1.49	2.6	1.48	2.5
8	1.48	2.5	1.47	2.5
9	1.48	2.5	1.45	2.4
10	1.47	2.5	1.44	2.4
11	1.46	2.5	1.43	2.4
12	1.44	2.4	1.44	2.4
13	1.59	2.9	1.45	2.4
14	1.49	2.6		
15	1.40	2.2		
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				

MONTHLY DISCHARGE of Fidler Brothers' Ditch from Boundary Creek, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
June (3-15).....	2.9	2.2	2.5			64
July (1-13).....	2.6	2.4	2.5			64
The period.....						128

BOUNDARY CREEK AT FIDLER BROTHERS' RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 20, Tp. 1, Rge. 26, W. 4th Mer.

Records available.—June 18, 1913, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 96.98 feet during 1913; 95.06 feet during 1914.

Bench-mark.—Permanent iron bench-mark located 25 feet from edge of left bank, and 20 feet downstream from the gauge.

Channel.—Consists of fine gravel, stone and clay; not liable to shift.

Discharge measurements.—Made by wading.

Winter flow.—Records are discontinued during the winter season.

Observer.—James Fidler.

DISCHARGE MEASUREMENTS of Boundary Creek at Fidler Brothers' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 31.....	O. H. Hoover.....	12.8	9.96	1.34	2.56	13.4
April 14.....	do.....	14.5	13.10	1.44	1.82	18.9
May 6.....	do.....	12.8	21.80	1.01	1.86	22.0
May 26.....	do.....	12.2	19.40	0.68	1.72	13.2
June 12.....	do.....	11.3	5.62	0.90	1.51	5.1
July 2.....	do.....	11.0	5.44	0.76	1.49	4.1
July 27.....	do.....	11.0	4.80	0.58	1.42	2.8
Aug. 18.....	do.....	12.0	9.25	0.69	1.60	6.4
Sept. 25.....	do.....	11.4	5.41	0.56	1.51	3.0
Nov. 6.....	do.....	12.0	8.98	1.09	1.66	9.8

DAILY GAUGE HEIGHT AND DISCHARGE of Boundary Creek at Fidler Brothers' Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.00	35.0	1.78	16.3	1.67	10.5
2.....	1.51	4.9	1.78	16.3	1.60	7.7
3.....	0.56	Nil.	1.76	15.1	1.54	5.7
4.....	0.53	"	1.78	16.3	1.58	7.0
5.....	0.65	"	1.79	16.9	1.66	10.1
6.....	0.53	"	1.85	21.0	1.67	10.5
7.....	1.86	22.0	1.86	22.0	1.65	9.6
8.....	1.96	31.0	1.92	27.0	1.64	9.2
9.....	1.92	27.0	1.94	29.0	1.63	8.8
10.....	1.77	15.7	1.87	23.0	1.60	7.7
11.....	1.75	14.5	1.86	22.0	1.59	7.4
12.....	1.74	14.0	1.84	20.0	1.58	7.0
13.....	1.78	16.3	1.83	20.0	1.57	6.7
14.....	1.80	17.5	1.82	19.0	1.57	6.7
15.....	1.81	18.2	1.80	17.5	1.50	7.4
16.....	1.81	18.2	1.79	16.9	1.71	12.4
17.....	1.75	14.5	1.78	16.3	1.69	11.4
18.....	1.72	12.9	1.76	15.1	1.66	10.1
19.....	1.70	11.9	1.76	15.1	1.55	6.0
20.....	1.70	11.9	1.78	16.3	1.55	6.0
21.....	1.74	14.0	1.80	17.5	1.54	5.7
22.....	1.78	16.3	1.78	16.3	1.55	6.0
23.....	1.76	15.1	1.76	15.1	1.57	6.7
24.....	1.74	14.0	1.76	15.1	1.58	7.0
25.....	1.70	11.9	1.74	14.0	1.64	9.2
26.....	1.70	11.9	1.74	14.0	1.74	14.0
27.....	1.69	11.4	1.72	12.9	1.73	13.5
28.....	1.70	11.9	1.70	11.9	1.64	9.2
29.....	1.70	11.9	1.70	11.9	1.64	9.2
30.....	1.69	11.4	1.69	11.4	1.64	9.2
31.....			1.68	11.0		

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DAILY GAUGE HEIGHT AND DISCHARGE of Boundary Creek at Fidler Brothers' Ranch,
for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.42	2.8	1.40	2.1	1.53	3.8	1.51	3.2
2.....	1.42	2.8	1.39	2.0	1.53	3.8	1.52	3.6
3.....	1.48	4.1	1.39	1.9	1.52	3.4	1.52	3.6
4.....	1.46	3.6	1.38	1.8	1.51	3.1	1.53	3.9
5.....	1.48	4.1	1.38	1.7	1.51	3.1	1.53	4.0
6.....	1.48	4.1	1.38	1.7	1.52	3.4	1.53	4.0
7.....	1.49	4.4	1.37	1.5	1.52	3.4	1.54	4.3
8.....	1.49	4.4	1.37	1.5	1.53	3.8	1.54	4.3
9.....	1.48	4.1	1.38	1.6	1.53	3.8	1.55	4.7
10.....	1.46	3.6	1.39	1.7	1.52	3.4	1.57	5.4
11.....	1.46	3.6	1.39	1.7	1.52	3.4	1.60	6.6
12.....	1.44	3.2	1.39	1.7	1.54	4.1	1.72	12.6
13.....	1.46	3.6	1.40	1.8	1.55	4.4	1.76	15.3
14.....	1.68	11.0	1.40	1.8	1.54	4.1	1.77	16.0
15.....	1.50	4.6	1.39	1.6	1.55	4.4	1.78	16.8
16.....	1.45	3.4	1.39	1.6	1.54	4.1	1.75	14.7
17.....	1.49	4.4	1.67	8.7 _a	1.54	4.1	1.76	15.4
18.....	1.48	4.1	1.66	8.6	1.54	4.1	1.78	16.8
19.....	1.48	4.1	1.56	4.8	1.54	4.1	1.78	16.8
20.....	1.48	4.1	1.56	4.8	1.54	4.1	1.79	17.6
21.....	1.47	3.9	1.55	4.4	1.54	4.1	1.80	18.4
22.....	1.47	3.9	1.55	4.4	1.53	3.8	1.81	19.2
23.....	1.46	3.6	1.53	3.8	1.53	3.8	1.82	20.0
24.....	1.46	3.6	1.56	4.8	1.53	3.8	1.79	17.7
25.....	1.46	3.5	1.55	4.4	1.53	3.6	1.78	17.0
26.....	1.45	3.4	1.54	4.1	1.52	3.4 _b	1.78	17.0
27.....	1.45	3.4	1.54	4.1	1.52	3.5	1.77	16.4
28.....	1.44	3.1 _a	1.53	3.8	1.52	3.5	1.76	15.8
29.....	1.43	2.8	1.53	3.8	1.52	3.5	1.76	15.8
30.....	1.42	2.6	1.52	3.4	1.51	3.2	1.75	15.5
31.....	1.41	2.4	1.52	3.4			1.75	15.5 _b

a to *a* Shifting conditions.*b* to *b* Shifting conditions.

MONTHLY DISCHARGE of Boundary Creek at Fidler Brothers' Ranch, for 1914.

(Drainage area 48 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (1-30).....	35.0	0.0	13.8	0.288	0.32	821
May.....	29.0	11.0	17.2	0.358	0.41	1,058
June.....	14.0	5.7	8.6	0.179	0.20	512
July.....	11.0	2.4	3.9	0.081	0.09	240
August.....	8.7	1.5	3.2	0.067	0.08	197
September.....	4.4	3.1	3.7	0.077	0.09	220
October (1-31).....	20.0	3.2	12.2	0.254	0.29	750
The period.....					1.48	3,798

ST. MARY RIVER NEAR KIMBALL.

Location.—Cable station on the SW. $\frac{1}{4}$ Sec. 25, Tp. 1, Rge. 25, W. 4th Mer., about 2,000 feet above the Alberta Railway and Irrigation Company's Dam.

Records available.—April 13, 1908, to December 31, 1914.

Gauges.—Friez automatic stage recorder housed in a concrete shelter, about 3,000 feet above the cable station; zero of auto. gauge maintained at 88.75 feet during 1913-14. Vertical staff at summer cable station; zero of staff maintained at 85.84 feet during 1914. Chain gauge at winter station located at the bridge on the SW. $\frac{1}{4}$ Sec. 1, Tp. 2, Rge. 25, W. 4th Mer.; zero of chain gauge maintained at 86.97 feet during 1914.

Bench-marks.—At auto. gauge: a spike on the downstream side of the concrete shelter; assumed elevation, 100.00 feet. At summer station: a permanent iron bench-mark; assumed elevation, 100.00 feet. At winter station: a permanent iron bench-mark; assumed elevation, 100.00 feet; located 131 feet NE. of the right abutment of the bridge.

Channel.—Consists of sand and gravel; liable to slight shifting conditions.

Discharge measurements.—Made from a cable car.

Winter flow.—Difficulty is often experienced in obtaining accurate discharges during the winter months on account of slush ice and the formation of more than one layer of ice. Measurements of this season are obtained at the SW. $\frac{1}{4}$ Sec. 1, Tp. 2, Rge. 25, W. 4th Mer.

Diversions.—Alberta Railway and Irrigation Company's Canal, capacity about 700 sec.-ft., below the station about one mile.

Observer.—J. M. Dunn.

Remarks.—The station is maintained in co-operation with the stream measurement work carried out by United States Geological Surveys.

DISCHARGE MEASUREMENTS of St. Mary River near Kimball, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 12.....	J. E. Degnan.....	42	134	1.60	3.61 _a	214
Jan. 23.....	do.....	97	144	0.57	3.20	82
Feb. 11.....	do.....	37	56	1.71	5.40	96
Feb. 26.....	do.....	40	60	1.96	5.50	119
Mar. 13.....	W. A. Burton.....	58	93	2.45	5.11	229
Mar. 23.....	O. H. Hoover.....	120	86	1.16	4.34	100
April 7.....	do.....	95	168	1.76	2.59 _b	295
April 20.....	do.....	223	413	2.20	3.00 _c	910
May 13.....	do.....	229	591	3.30	4.10	1,952
May 23.....	W. A. Lamb (U.S.G.S.).....	230	611	4.11	4.53	2,510
June 2.....	O. H. Hoover.....	228	639	4.25	4.63	2,718
June 21.....	W. A. Lamb (U.S.G.S.).....	229	605	4.03	4.53	2,440
June 23.....	O. H. Hoover.....	228	546	3.75	4.19	2,049
July 15.....	do.....	226	490	3.25	3.77	1,591
July 21.....	W. A. Lamb (U.S.G.S.).....	226	414	2.87	3.40	1,190
Aug. 11.....	O. H. Hoover.....	197	299	2.18	2.71	654
Sept. 2.....	do.....	189	278	2.11	2.56	588
Sept. 5.....	do.....	186	266	1.99	2.49	529
Sept. 10.....	W. A. Lamb (U.S.G.S.).....	183	259	1.84	2.46	477
Sept. 18.....	O. H. Hoover.....	181	251	1.88	2.36	470
Sept. 22.....	do.....	206	328	2.45	2.97	806
Oct. 1.....	do.....	196	304	2.30	2.78	700
Oct. 10.....	do.....	198	309	2.27	2.80	700
Oct. 16.....	do.....	224	380	2.73	3.18	1,036
Nov. 12.....	do.....	201	321	2.44	2.89 _c	791
Nov. 26.....	do.....	178	234	1.81	2.30 _d	422
Dec. 14.....	do.....	65	100	2.07	2.37 _d	267

a to b Gauge heights from winter gauge.

c to e Gauge heights from automatic gauge.

d Gauge heights from winter gauge.

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DAILY GAUGE HEIGHT AND DISCHARGE OF St. Mary River near Kimball, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.29 ^a	85	.....	81	.....	128	3.99	265	3.28	1,092	4.38	2,314
2.....	2.30	94	3.62	78	5.25	139	3.94	275	3.73	1,543	4.59	2,587
3.....	2.35	103	3.42	73	5.25	148	3.94	288	4.20	2,085	4.83	2,899
4.....	.....	114	.....	71	5.20	157	3.84	312	4.10	1,965	5.00	3,120
5.....	2.70	123	5.42	70	5.20	168	3.84	290	3.93	1,764	4.98	3,094
6.....	2.75	135	5.42	73	5.20	177	2.94	265	3.85	1,675	4.88	2,964
7.....	2.85	146	5.47	78	5.18	186	2.61	295	3.84	1,664	4.70	2,730
8.....	2.82	159	.....	82	.....	197	2.59	320	3.86	1,686	4.48	2,444
9.....	2.85	172	.....	87	.....	207	2.59	343	3.88	1,708	4.30	2,210
10.....	3.00	183	.....	90	5.15	215	2.59	362	4.10	1,965	4.08	1,941
11.....	3.30	198	5.40	96	5.15	222	2.54 ^a	364	4.17	2,049	3.95	1,788
12.....	3.70	215	5.40	97	5.15	226	2.18 ^b	366	4.09	1,953	3.92	1,753
13.....	3.40	195	5.40	98	5.12	229	2.33	440	4.10	1,965	4.25	2,148
14.....	3.25	182	5.40	98	5.11	230	2.47	510	4.17	2,049	4.50	2,470
15.....	3.25	175	.....	100	5.11	228	2.55	555	4.31	2,223	4.45	2,405
16.....	3.25	165	5.50	105	5.10	220	2.68	633	4.50	2,470	4.38	2,314
17.....	3.25	156	5.60	111	5.05	205	2.68	633	4.67	2,691	4.42	2,366
18.....	.....	143	5.60	118	5.05	190	2.63	603	4.73	2,769	4.51	2,483
19.....	3.30	138	5.85	122	5.00	190	2.76	684	4.75	2,795	4.60	2,600
20.....	3.25	128	5.90	127	5.00	182	3.00	855	4.78	2,834	4.62	2,626
21.....	3.25	115	.....	130	5.00	178	3.12	952	4.76	2,808	4.55	2,535
22.....	.....	97	.....	127	.....	185	3.10	935	4.65	2,665	4.48	2,444
23.....	3.20	82	6.00	122	.....	189	3.15	978	4.58	2,574	4.21	2,098
24.....	3.40	81	5.50	119	.....	160	3.23	1,047	4.00	2,600	4.05	1,905
25.....	.....	85	5.45	117	4.34	100	3.23	1,047	4.77	2,821	3.98	1,822
26.....	.....	85	5.50	119	.....	98	3.28	1,092	4.78	2,834	3.97	1,810
27.....	3.55	78	5.40	120	.....	102	3.28	1,092	4.62	2,626	3.95	1,788
28.....	3.55	77	5.35	123	.....	170	3.32	1,129	4.53	2,509	3.94	1,776
29.....	.....	82	.....	.....	3.85	202	3.28	1,092	4.43	2,379	3.92	1,753
30.....	3.60	85	.....	.....	3.95	222	3.26	1,074	4.29	2,198	3.91	1,742
31.....	3.65	84	.....	.....	3.95	248	.....	.....	4.28	2,185	.....	.....

^a Gauge heights to April 11 are readings on winter gauge-rod.^b Gauge heights April 12 to Dec. 4 recorded by auto gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of St. Mary River near Kimball, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.86	1,686	2.97	832	2.64	609	2.77	690	2.70	645	2.42	367 <i>d</i>
2.....	3.85	1,675	2.94	810	2.57	567	2.83	731	2.77	691	2.17	362
3.....	3.89	1,719	2.94	810	2.52	537	2.86	752	2.92	795	2.18	366
4.....	3.92	1,753	2.96	825	2.50	525	2.91	788	3.08	919	2.07	316
5.....	4.02	1,869	2.93	802	2.47	510	2.93	802	3.11	944	3.29 <i>c</i>	310
6.....	4.11	1,977	2.92	795	2.46	505	2.90	780	3.19	1,012	3.29	302
7.....	4.12	1,989	2.94	810	2.47	510	2.87	759	3.19	1,012	3.24	290
8.....	4.06	1,917	2.88	766	2.45	500	2.82	724	3.19	1,012	3.19	277
9.....	4.03	1,881	2.82	724	2.44	495	2.81	717	3.09	927	3.59	272
10.....	4.00	1,845	2.78	697	2.42	485	2.80	710	2.98	840	3.39	272
11.....	3.97	1,810	2.68	633	2.39	470	2.78	697	2.95	818	3.59	273
12.....	3.92	1,753	2.67	627	2.37	460	2.74	671	2.90	780	.....	269
13.....	3.87	1,697	2.64	609	2.34	445	2.75	678	2.93	802	.....	267
14.....	3.87	1,697	2.61	591	2.31	430	2.82	724	2.90	780	3.41	267
15.....	3.81	1,631	2.57	567	2.27	410	2.97	832	2.90	780	3.61	260
16.....	3.72	1,532	2.53	543	2.31	430	3.20	1,020	2.99	848	3.95	250
17.....	3.62	1,426	2.74	671	2.36	455	3.40	1,205	2.90	780	3.95	239
18.....	3.58	1,385	2.97	832	2.36	455	3.45	1,255	2.83	731	.....	238
19.....	3.46	1,265	2.98	840	2.48	515	3.38	1,186	2.83	731	5.90	239
20.....	3.43	1,235	2.94	810	2.68	633	3.31	1,120	2.78	697	5.30	235
21.....	3.42	1,225	2.87	759	2.89	773	3.24	1,056	2.74	671	5.30	223
22.....	3.35	1,158	2.84	738	2.95	818	3.19	1,012	2.52	537	5.35	219
23.....	3.24	1,056	2.85	745	2.92	795	3.14	969	2.34	445	5.40	221
24.....	3.18	1,003	2.90	780	2.91	788	3.07	911	2.32	435	5.45	221
25.....	3.13	960	2.86	752	2.82	724	2.99	848	2.34	445	.....	216
26.....	3.07	911	2.82	724	2.80	710	2.94	810	2.31	430	5.40	207
27.....	3.02	871	2.75	678	2.90	780	2.90	780	2.26	405	5.35	200
28.....	3.00	855	2.72	658	2.86	752	2.85	745	2.23	390	4.95	193
29.....	3.00	855	2.68	633	2.82	724	2.82	724	2.20	375	4.55	188
30.....	3.00	855	2.65	615	2.80	710	2.76	684	2.79	371 <i>d</i>	5.30	185
31.....	2.98	840	2.64	609	.....	.....	2.75	678	.....	.....	5.27 <i>c</i>	183

c to *c* Gauge heights from staff gauge at SW. 1-2-25-4.*d* Discharge estimated.

MONTHLY DISCHARGE of St. Mary River near Kimball, for 1914.

(Drainage area 472 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	215	77	128	0.271	0.31	7,870
February.....	130	70	101	0.214	0.22	5,609
March.....	248	98	184	0.390	0.45	11,314
April.....	1,129	265	637	1.350	1.51	37,904
May.....	2,834	1,092	2,230	4.725	5.45	137,120
June.....	3,120	1,742	2,331	4.939	5.51	138,700
July.....	1,980	840	1,430	3.030	3.49	87,930
August.....	840	543	719	1.523	1.76	44,210
September.....	818	410	584	1.237	1.38	34,750
October.....	1,255	671	841	1.782	2.05	51,711
November.....	1,012	375	702	1.488	1.66	41,772
December.....	367	183	256	0.542	0.62	15,741
The year.....	.....	.....	.....	.....	24.40	614,631

SESSIONAL PAPER No. 25c

ALBERTA RAILWAY AND IRRIGATION COMPANY CANAL NEAR KIMBALL.

Location.—On the SE. $\frac{1}{4}$ Sec. 21, Tp. 2, Rge. 24, W. 4th Mer., at the flume over Rolph Creek.

Records available.—July 26, 1910, to October 6, 1914.

Gauge.—Vertical staff; datum unchanged.

Channel.—Smooth plank flume, 768 feet long.

Discharge measurements.—Made from a foot bridge spanning the flume at a point about midway from the ends.

Artificial control.—The discharge is controlled by headgates at Kimball, about six miles above the flume.

Observer.—J. M. Dunn.

Remarks.—A new flume was built just to the right, to replace the old structure, during October, November and December. It is 27 feet wide and 8 feet deep. A vertical metal staff is countersunk in the left side of this flume about midway from the ends for future gauge height records.

DISCHARGE MEASUREMENTS of Alberta Railway and Irrigation Company Canal near Kimball, for 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 14.	O. H. Hoover.	27.2	83.8	5.98	2.92	502
June 3.	do.	27.2	102.5	6.50	3.62	666
June 23.	do.	27.2	108.1	6.81	3.83	736
June 27.	do.	27.2	105.4	6.68	3.75	705
July 16.	do.	27.2	104.0	6.49	3.69	672
July 16.	do.	27.2	103.6	6.49	3.69	672
July 22.	do.	27.2	101.0	6.39	3.61	644
Aug. 12.	do.	27.2	87.9	5.93	3.18	521
Aug. 14.	do.	27.2	85.7	5.91	3.10	507
Aug. 27.	do.	27.2	87.7	5.93	3.16	520
Sept. 2.	do.	27.2	83.8	5.78	3.02	483
Sept. 9.	do.	27.2	73.4	5.36	2.67	394
Sept. 17.	do.	27.2	72.3	5.22	2.64	378
Sept. 20.	do.	27.2	37.6	2.83	1.31	107
Sept. 20.	do.	27.2	27.1	2.18	0.93	59
Sept. 20.	do.	27.2	21.0	1.81	0.75	38
Sept. 21.	do.	27.2	57.4	4.35	2.10	250
Sept. 21.	do.	27.2	64.5	4.86	2.36	313
Oct. 1.	do.	27.2	71.2	5.13	2.56	365

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company Canal
near Kimball, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec. ft.</i>	<i>Feet.</i>	<i>Sec. ft.</i>	<i>Feet.</i>	<i>Sec. ft.</i>
1.....			2 23	283	3 52	627
2.....			2 25	288	3 52	627
3.....			2 58	365	3 62	658
4.....			2 60	370	3 75	700
5.....			2 60	370	3 75	700
6.....			2 58	365	3 75	700
7.....			2 70	395	3 74	697
8.....			2 75	408	3 72	691
9.....			2 76	411	3 74	697
10.....			2 77	413	3 76	704
11.....			2 77	413	3 75	700
12.....			2 77	413	3 75	700
13.....			2 90	448	3 74	697
14.....			2 92	453	3 75	700
15.....			2 91	451	3 75	700
16.....			2 93	456	3 75	700
17.....			2 93	456	3 75	700
18.....			2 93	456	3 75	700
19.....			2 91	451	3 75	700
20.....			2 90	448	3 75	700
21.....			3 12	509	3 79	714
22.....			3 00	475	3 80	717
23.....			3 12	509	3 83	727
24.....			3 20	531	3 80	717
25.....			3 20	531	3 82	724
26.....			3 20	531	3 75	700
27.....			3 20	531	3 75	700
28.....			3 19	528	3 75	700
29.....	2 23 ^a	283	3 45	606	3 75	700
30.....	2 23	283	3 40	590	3 70	684
31.....			3 48	615		

^a Gates opened.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company Canal
near Kimball, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.68	678	3.46	609	3.00	475	2.50	346
2.....	3.70	684	3.46	609	3.01	478	2.50	346
3.....	3.70	684	3.45	606	3.02	481	2.50	346
4.....	3.70	684	3.45	606	3.01	478	2.65	382
5.....	3.70	684	3.42	596	3.00	475	2.20	276
6.....	3.68	678	3.42	596	2.75	408	2.20	2766
7.....	3.70	684	3.42	596	2.65	382		
8.....	3.70	684	3.38	584	2.65	382		
9.....	3.70	684	3.32	566	2.68	390		
10.....	3.70	684	3.28	556	2.65	382		
11.....	3.69	681	3.25	545	2.55	358		
12.....	3.69	681	3.18	525	2.50	346		
13.....	3.70	684	3.15	517	2.50	346		
14.....	3.69	681	3.12	509	2.45	334		
15.....	3.70	684	3.08	497	2.40	322		
16.....	3.69	681	3.05	489	2.42	327		
17.....	3.70	684	3.35	575	2.55	358		
18.....	3.69	681	2.95	462	2.54	356		
19.....	3.69	681	3.08	497	2.55	358		
20.....	3.70	684	3.08	497	1.40	122		
21.....	3.70	684	3.16	520	2.56	360		
22.....	3.61	655	3.25	545	2.50	346		
23.....	3.59	649	3.25	545	2.50	346		
24.....	3.59	649	3.25	545	2.50	346		
25.....	3.58	646	3.15	517	2.50	346		
26.....	3.57	643	3.15	517	2.50	346		
27.....	3.52	627	3.15	517	2.50	346		
28.....	3.48	615	3.15	517	2.50	346		
29.....	3.47	612	3.15	517	2.50	346		
30.....	3.47	612	3.15	517	2.50	346		
31.....	3.46	609	3.15	517				

b Headgates closed for season.MONTHLY DISCHARGE of Alberta Railway and Irrigation Company Canal near Kimball,
for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
April (29-30).....	283	283	283	1,122
May.....	615	283	454	27,915
June.....	727	627	695	41,415
July.....	684	609	666	40,951
August.....	609	462	542	33,326
September.....	481	122	368	21,898
October (1-6).....	382	276	329	3,911
The period.....				170,538

ALBERTA RAILWAY AND IRRIGATION COMPANY CANALS.

The main canal of the Alberta Railway and Irrigation Company diverts water from the St. Mary River on the SE. $\frac{1}{4}$ Sec. 36, Tp. 1, Rge. 25, W. 4th Mer.

The discharge measurements published herewith were made during investigations to determine absorption losses, conducted by this department during 1913 and 1914.

DISCHARGE MEASUREMENTS of Main Canal near Kimball, in 1914.

(SE. 21-2-24-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 11..... 1914.	R. J. McGuinness.....	27.2	103.3	6.22	3.69	642
July 13.....	do	48.0	241.9	2.72	3.70	659 ^a

^a Measurement at NE. 36-1-25-4.

DISCHARGE MEASUREMENTS of Pinepound Spillway at Spring Coulee, in 1914.

(NE. 29-4-23-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 15..... 1914.	R. J. McGuinness.....	24.0	14.0	0.89	2.90	12.6

DISCHARGE MEASUREMENTS of Main Canal at Spring Coulee, in 1914.

(NW. 28-4-23-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 15..... 1914.	R. J. McGuinness.....	50.5	146.6	4.07	4.69	597

DISCHARGE MEASUREMENTS of Magrath Lateral near Headgates, in 1913-14.

(SW. 9-5-22-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 24..... 1913.	G. D. Walters.....	9.5	12.3	1.37	2.10	16.8
Aug. 14.....	do	9.0	3.0	0.67	1.14	2.0
Aug. 27.....	do	9.5	9.6	0.97	1.72	9.4
Aug. 27.....	do	9.5	9.6	0.98	1.72	9.5
Aug. 28.....	G. R. Elliott.....	9.7	11.9	0.88	1.72	10.4
Aug. 29.....	R. J. Srigley.....	10.4	11.1	0.70	1.72	7.7
Aug. 29.....	do	9.6	8.5	1.10	.....	9.4 ^a
Sept. 1.....	do	9.4	8.7	1.00	1.64	8.7
Sept. 2.....	G. R. Elliott.....	9.8	10.4	0.74	1.64	7.7
Sept. 3.....	R. J. Srigley.....	9.4	8.6	1.00	1.58	8.6
Sept. 3.....	do	10.1	5.7	1.41	2.40	8.1 ^b
Sept. 3.....	do	9.3	7.1	1.13	.....	8.1 ^a
July 16..... 1914.	R. J. McGuinness.....	12.2	14.4	2.09	2.65	30.0
July 16.....	do	12.0	13.8	1.25	2.65	17.3
Sept. 22.....	do	7.6	9.1	1.09	1.30	9.9
Sept. 23.....	do	7.6	9.3	1.14	1.22	10.6
Sept. 24.....	do	7.6	9.3	1.15	1.22	10.7
Sept. 25.....	do	7.6	7.6	0.89	1.00	6.8
Sept. 26.....	do	7.6	7.6	0.91	1.00	7.0
Sept. 30.....	do	7.6	10.6	1.28	1.40	13.6
Sept. 30.....	do	7.6	10.6	1.26	1.40	13.3
Sept. 30.....	do	7.6	10.6	1.25	1.40	13.3
Sept. 30.....	do	7.6	10.6	1.27	1.40	13.5
Oct. 1.....	do	7.6	11.0	1.33	1.45	14.6
Oct. 2.....	do	7.6	8.7	0.92	1.15	8.0

^a Measurement one mile downstream.^b Measurement at headgates.

SESSIONAL PAPER No. 25c

DISCHARGE MEASUREMENTS of Distributaries from Magrath Lateral, in 1914.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914.							
July 18.	SW. 21-5-22-4	R. J. McGuinness.					2.20
July 18.	SE. 20-5-22-4	do					1.79
July 18.	NE. 20-5-22-4	do					0.39
July 18.	NE. 20-5-22-4	do					6.23
July 18.	SE. 20-5-22-4	do					1.77
July 18.	NW. 32-5-22-4	do					1.29
July 18.	SE. 6-6-22-4	do					1.71a

a Magrath Lateral.

DISCHARGE MEASUREMENTS of Pothole Creek at Magrath, in 1913-14.

(SE. 26-5-22-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913.						
July 24.	G. D. Walters.	33.0	31.7	1.73	1.30	55
Aug. 14.	do	54.0	42.7	1.95	1.33	83
Aug. 27.	do	54.0	69.6	3.06	1.88	213
Aug. 27.	do	54.5	69.7	2.81	1.87	196
Aug. 28.	G. R. Elliott.	54.5	76.0	2.94	1.82	223
Sept. 1.	R. J. Srigley.	54.5	62.6	2.11	1.58	132
Sept. 2.	G. R. Elliott.	54.5	62.5	2.14	1.56	134
Sept. 3.	R. J. Srigley.	53.5	63.1	2.06	1.55	130
Sept. 4.	do	54.6	53.2	1.75	1.37	97
Sept. 5.	G. R. Elliott.	55.4	52.5	1.84	1.36	97
1914.						
July 17.	R. J. McGuinness.	52.0	49.4	2.28		108
July 17.	do	49.0	48.6	2.08		101a

a Measurement at NE. 17-7-21-4.

DISCHARGE MEASUREMENTS of Main Canal at Flume No. 2, in 1913-14.

(SW. 25-5-22-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913.						
June 24.	G. D. Walters.	22.0	67.0	4.09	2.93	275
Aug. 14.	do	22.0	67.2	4.16	2.94	280
Aug. 26.	R. J. Srigley.	22.0	66.1	4.12	2.89	272
Aug. 26.	G. R. Elliott.	22.0	66.4	4.11	2.90	273
Aug. 27.	G. D. Walters.	22.0	64.8	4.02	2.83	260
Aug. 27.	do	22.0	65.1	3.84	2.84	260
Aug. 28.	G. R. Elliott.	22.0	63.5	4.11	2.77	261
Aug. 30.	do	22.0	47.0	3.43	2.02	161
Sept. 1.	R. J. Srigley.	22.0	58.2	3.82	2.53	223
Sept. 2.	G. R. Elliott.	22.0	57.2	3.91	2.49	224
Sept. 3.	R. J. Srigley.	22.0	57.1	3.66	2.47	219
Sept. 4.	do	22.0	62.6	4.02	2.73	251
Sept. 5.	G. R. Elliott.	22.0	63.3	4.03	2.77	255
1914.						
July 16.	R. J. McGuinness.	22.4	85.8	5.34	3.75	458
Sept. 19.	do	22.2	56.3	4.34	2.28	244
Sept. 21.	do	22.2	56.7	2.51	0.97	64
Sept. 22.	do	22.2	64.1	4.31	2.66	277
Sept. 23.	do	22.2	64.4	4.24	2.65	273
Sept. 24.	do	22.2	63.2	4.35	2.60	275
Sept. 25.	do	22.2	63.2	4.37	2.60	277
Sept. 30.	do	22.2	64.4	4.35	2.65	280
Oct. 1.	do	22.2	65.5	4.35	2.70	285
Oct. 2.	do	22.2	67.7	4.39	2.80	298

DISCHARGE MEASUREMENTS of Main Canal at Welling, in 1913-14.

(NE. 5-6-21-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913						
July 28.....	G. D. Walters.....	44.2	127.2	2.18	2.40	278
Aug. 14.....	do.....	30.2	134.4	2.17	2.66	292
Aug. 27.....	G. R. Elliott.....	47.3	180.9	1.85	2.60	332
Aug. 28.....	R. J. Srigley.....	45.0	121.7	2.06	2.56	250
Aug. 28.....	do.....	45.0	118.0	2.09	2.09	248
Aug. 30.....	G. R. Elliott.....	44.8	114.7	2.06	2.44	243
Sept. 1.....	do.....	43.5	110.8	1.97	2.36	214
Sept. 2.....	R. J. Srigley.....	44.0	109.6	1.89	2.34	208
Sept. 3.....	G. R. Elliott.....	44.2	112.1	1.78	2.36	206
Sept. 4.....	do.....	46.0	125.3	2.17	2.63	252
Sept. 5.....	R. J. Srigley.....	45.5	119.5	2.09	2.62	250
Oct. 6.....	G. D. Walters.....	44.0	132.1	2.11	2.64	278
1914						
July 18.....	R. J. McGuinness.....	46.0	162.4	2.92	3.16	445
Sept. 21.....	do.....	37.7	46.6	1.03	0.71	48
Sept. 22.....	do.....	46.7	116.5	2.22	2.55	258

DISCHARGE MEASUREMENTS of Raymond Lateral at Headgates, in 1913-14.

(SE. 5-6-21-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913.						
July 28.....	G. D. Walters.....	12.0	16.8	2.96	1.40	50.0
Aug. 15.....	do.....	12.0	13.2	2.90	1.10	38.0
Aug. 27.....	G. R. Elliott.....	12.0	12.6	2.95	1.05	37.0
Aug. 28.....	R. J. Srigley.....	12.0	12.0	2.99	1.00	36.0
Aug. 29.....	G. R. Elliott.....	12.0	9.1	3.04	0.76	28.0
Aug. 29.....	do.....	16.4	18.6	1.35	.....	25.0a
Aug. 30.....	R. J. Srigley.....	12.0	7.8	3.02	0.65	24.0
Sept. 1.....	G. R. Elliott.....	12.0	7.2	3.06	0.60	22.0
Sept. 2.....	R. J. Srigley.....	12.0	7.2	3.05	0.60	22.0
Sept. 3.....	G. D. Walters.....	12.0	7.7	3.02	0.64	23.0
Sept. 3.....	do.....	16.0	18.2	1.26	.....	23.0a
Sept. 5.....	R. J. Srigley.....	12.0	14.4	3.03	1.20	44.0
1914.						
July 18.....	R. J. McGuinness.....	12.0	24.2	2.91	2.05	71.0
July 25.....	do.....	12.0	24.6	2.80	2.05	70.0
July 25.....	do.....	5.6	14.0	2.82	.....	39.0a
Sept. 21.....	do.....	12.0	6.2	1.53	0.50	9.6
Sept. 21.....	do.....	12.0	12.1	2.04	0.99	25.0
Sept. 22.....	do.....	12.0	24.2	2.63	2.00	64.0
Sept. 23.....	do.....	12.0	18.5	2.27	1.52	42.0
Sept. 23.....	do.....	12.0	18.2	2.38	1.50	43.0
Sept. 24.....	do.....	12.0	15.5	2.07	1.27	32.0
Sept. 24.....	do.....	12.0	10.0	1.81	0.81	18.0
Sept. 25.....	do.....	12.0	22.4	2.63	1.85	59.0
Oct. 2.....	do.....	12.0	21.8	2.60	1.80	57.0

a Measurement one mile downstream.

SESSIONAL PAPER No. 25c

DISCHARGE MEASUREMENTS of Tributaries from Raymond Lateral, in 1914.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914.							
July 25.	NE. 4-6-21-4.	R. J. McGuinness.	3.9	3.9	1.26		4.90
July 25.	NW. 2-6-21-4.	do	3.4	3.1	1.22		3.80
July 25.	NE. 2-6-21-4.	do	3.0	1.7	0.88		1.49
July 25.	NW. 1-6-21-4.	do	4.5	3.6	0.83		3.00
July 25.	SE. 12-6-21-4.	do	2.1	1.7	1.71		2.80
July 25.	SW. 7-6-20-4.	do	3.0	1.7	1.17		1.98
July 25.	SW. 7-6-20-4.	do	3.7	2.2	1.50		3.30
July 25.	SE. 7-6-20-4.	do	6.0	3.1	0.82		2.50
July 25.	SE. 7-6-20-4.	do	3.7	3.8	0.42		1.61
July 25.	SE. 8-6-20-4.	do	2.0	1.0	0.82		0.82
July 27.	SE. 9-6-20-4.	do	2.9	1.4	1.06		1.51
July 27.	NW. 10-6-20-4.	do	3.4	1.1	0.55		0.60
July 27.	SE. 15-6-20-4.	do	3.0	1.3	0.98		1.25
July 27.	SW. 14-6-20-4.	do	3.5	2.8	2.90		8.10
July 27.	SW. 14-6-20-4.	do	3.3	1.4	0.82		1.15
July 27.	SE. 14-6-20-4.	do	3.3	4.8	1.04		5.00
July 27.	SW. 13-6-20-4.	do	3.7	2.6	1.17		3.03
July 27.	NW. 7-6-19-4.	do	3.5	2.2	1.05		2.20
July 27.	NW. 8-6-19-4.	do	3.0	1.4	1.07		1.47
July 27.	NE. 8-6-19-4.	do	6.0	8.4	1.31		11.30a

a Raymond Lateral.

DISCHARGE MEASUREMENTS of Main Canal at NW. 36-6-21-4, in 1913-14.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1913.						
July 28.	G. D. Walters.	47.0	83.5	2.09	1.84	175
Aug. 15.	do	51.0	116.6	1.99	2.18	233
Aug. 27.	G. R. Elliott.	50.8	110.0	1.89	2.17	207
Aug. 28.	G. D. Walters.	51.5	114.2	1.95	2.16	209
Aug. 28.	do	51.5	109.3	2.02	2.15	221
Aug. 30.	R. J. Srigley.	52.3	106.8	1.66	1.96	177
Sept. 2.	do	52.0	100.9	1.80	2.02	181
Sept. 4.	G. R. Elliott.	50.3	123.5	1.74	2.12	202
Sept. 5.	R. J. Srigley.	55.7	119.5	1.86	2.15	221
Oct. 6.	G. D. Walters.	49.0	119.1	1.89	2.10	225
1914.						
July 20.	R. J. McGuinness.	59.0	156.3	2.52	2.78	396

DISCHARGE MEASUREMENTS of Big Chin Canal at Headgates, in 1914.

(SW. 18-8-20-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 21.	R. J. McGuinness.	30.2	56.1	2.82	2.28	158
Sept. 28.	do	29.9	39.2	1.48	1.37	58
Sept. 29.	do	28.3	23.8	1.26	0.98	30

DISCHARGE MEASUREMENTS of Main Canal at Big Chin Gates, in 1914.

(SE. 13-8-21-4.)

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
July 21.....	R. J. McGuinness.....	32.0	130.4	2.77	.....	361a
July 22.....	do.....	25.8	90.0	2.10	3.20	201
Sept. 28.....	do.....	25.7	67.0	1.91	2.70	128
Sept. 29.....	do.....	25.0	41.8	0.89	1.69	37

a Measurement at NW. 7-8-20-4.

DISCHARGE MEASUREMENTS of Distributaries from Main Canal, in 1914.

Date.	Location.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1914.							
July 22.....	NW. 7-8-20-4....	R. J. McGuinness	6.0	2.7	1.09	.....	3.00
July 22.....	SW. 7-8-20-4....	do	3.5	2.7	1.19	.....	3.20
July 22.....	NE. 6-8-20-4....	do	3.0	1.6	1.50	.....	2.40
July 22.....	NE. 31-7-20-4....	do	2.1	0.8	0.70	.....	0.54
July 22.....	NE. 36-7-21-4....	do	4.8	4.3	1.92	.....	8.40

ROLPH CREEK NEAR KIMBALL.

Location.—On the SE. $\frac{1}{4}$ Sec. 21, Tp. 2, Rge. 24, W. 4th Mer.*Records available.*—May 17, 1911, to October 31, 1914.*Gauge.*—Vertical staff; zero of gauge maintained at 93.41 feet during 1913-14.*Bench-mark.*—Permanent iron bench-mark located on the left bank 100 feet downstream; assumed elevation, 100.00 feet.*Channel.*—Consists of sand, gravel and stone; likely to shift.*Discharge measurements.*—Made by wading.*Observer.*—J. M. Dunn.

DISCHARGE MEASUREMENTS of Rolph Creek near Kimball, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 11.....	O. H. Hoover.....	11.7	7.50	2.12	1.07	15.90
April 21.....	do.....	8.1	3.65	1.31	0.63	4.80
May 14.....	do.....	8.4	4.16	1.21	0.64	5.00
June 3.....	do.....	3.8	0.83	0.35	0.49	0.30
June 23.....	do.....	.....a	.....	.....	0.57	0.21
July 16.....	do.....	.....a	.....	.....	0.60	0.38
Aug. 12.....	do.....	.....a	.....	.....	0.60	0.13
Sept. 21.....	do.....	.....a	.....	.....	0.65	0.05
Oct. 17.....	do.....	20.3	20.70	1.98	1.44	41.00

a Weir measurement.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Rolph Creek near Kimball, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.56	55.0	0.60	4.30	0.45	Nil.
2.....	1.55	54.0	0.60	4.30	0.47	0.10
3.....	1.53a	51.0	0.60	4.30	0.50	0.30
4.....	1.51	49.0	0.60	4.30	0.50	0.40
5.....	1.44a	42.0	0.65	5.20	0.50	0.35
6.....	1.38a	36.0	0.70	6.20	0.50	0.30
7.....	1.31a	30.0	0.75	7.20	0.50	0.20
8.....	1.25a	26.0	0.85	9.50	0.49	Nil.
9.....	1.18a	21.0	0.85	9.50	0.48	"
10.....	1.11	17.7	0.85	9.50	0.47	"
11.....	1.07	16.1	0.85	9.50	0.47	"
12.....	1.07a	16.1	0.70	6.20	0.47	"
13.....	1.06a	15.7	0.67	5.60	0.47	"
14.....	1.06	15.7	0.64	5.10	0.48	"
15.....	0.99a	13.2	0.63b	4.70	0.47	"
16.....	0.92a	11.3	0.60	4.10	0.47	"
17.....	0.85	9.5	0.60	4.00	0.47	"
18.....	0.80a	8.3	0.60	3.90	0.47	"
19.....	0.75a	7.2	0.60	3.80	0.47	"
20.....	0.70a	6.2	0.60	3.70	0.47	"
21.....	0.65	5.2	0.57	3.00	0.50a	"
22.....	0.64a	5.1	0.55	2.60	0.53a	"
23.....	0.63a	4.9	0.55	2.50	0.57	0.21
24.....	0.62	4.7	0.53	2.00	0.54a	Nil.
25.....	0.62a	4.7	0.53	1.90	0.52a	"
26.....	0.61a	4.5	0.50	1.20	0.50	"
27.....	0.61a	4.5	0.48	0.75	0.50	"
28.....	0.60	4.3	0.47	0.45	0.50	"
29.....	0.62	4.7	0.45	0.10	0.50	"
30.....	0.60	4.3	0.45	Nil.	Dry.b	"
31.....			0.45	"		

a Gauge height interpolated.

b to b Shifting conditions May 15 to Sept. 21.

DAILY GAUGE HEIGHT AND DISCHARGE of Rolph Creek near Kimball, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	Dry. ^b	Nil.	0.55	Nil.	0.67	0.85	0.71 _a	1.93
2.....	"	"	0.55	"	0.67	0.77	0.73 _a	2.60
3.....	"	"	0.58	"	0.65	0.69	0.75 _a	3.20
4.....	"	"	0.60	0.25	0.67	0.61	0.77 _a	3.90
5.....	0.50	"	0.60	0.23	0.65	0.53	0.80	4.90
6.....	0.50	"	0.60	0.22	0.65	0.45	0.80	4.90
7.....	0.50	"	0.60	0.21	0.65	0.43	0.85	6.60
8.....	0.50	"	0.60	0.19	0.65	0.41	0.90 _a	8.20
9.....	0.50	"	0.60	0.17	0.65	0.39	0.95 _a	10.10
10.....	0.54 _a	"	0.60	0.16	0.65	0.37	1.00 _a	12.00
11.....	0.56 _a	"	0.60	0.14	0.65	0.35	1.05 _a	14.10
12.....	0.58 _a	0.10	0.60	0.13	0.65	0.33	1.10 _a	16.23
13.....	0.60	0.45	0.60	0.46	0.70	0.31	1.15 _a	19.19
14.....	0.60	0.43	0.60	0.79	0.68	0.29	1.20	22.00
15.....	0.60	0.40	0.60	1.12	0.66	0.27	1.19 _a	21.00
16.....	0.60	0.38	0.60	1.45	0.65	0.25	1.18	21.00
17.....	0.60	0.36	0.70	1.80	0.65	0.21	1.15	19.10
18.....	0.60	0.34	0.67	1.60	0.65	0.17	1.15	19.10
19.....	0.60	0.32	0.67	1.40	0.65	0.13	1.14	18.50
20.....	0.60	0.30	0.65	1.20	0.65 _a	0.09	1.12	17.40
21.....	0.55	Nil.	0.65	1.00	0.65 _b	0.05	1.10	16.20
22.....	0.55	"	0.65	0.80	0.65	0.05	1.10	16.20
23.....	0.55	"	0.65	0.76	0.65	0.05	1.08	15.40
24.....	0.55	"	0.65	0.72	0.65	0.05	1.05	14.10
25.....	0.55	"	0.65	0.68	0.65	0.05	1.05	12.00
26.....	0.55	"	0.65	0.64	0.65	0.05	1.00	12.00
27.....	0.50	"	0.65	0.60	0.65	0.05	0.90	8.20
28.....	0.50	"	0.65	0.65	0.65	0.05	0.85	6.60
29.....	0.50	"	0.65	0.70	0.67 _a	0.67	0.80	4.90
30.....	0.50	"	0.65	0.75	0.69 _a	1.29	0.75	3.20
31.....	0.50	"	0.67	0.80			0.70	1.60

^a Gauge height interpolated.^b to ^b Shifting conditions May 15 to Sept. 21.

MONTHLY DISCHARGE of Rolph Creek near Kimball, for 1914.

(Drainage area 74 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	55.00	4.30	18.30	0.247	0.280	1,089
May.....	9.50	0.00	4.20	0.057	0.060	258
June.....	0.40	0.00	0.06	0.001	0.001	4
July.....	0.45	0.00	0.10	0.001	0.001	6
August.....	1.80	0.00	0.73	0.010	0.010	45
September.....	1.29	0.05	0.34	0.005	0.006	20
October.....	22.00	1.60	11.50	0.155	0.018	707
The period.....					0.376	2,129

LEE CREEK AT LAYTON'S RANCH.

Location.—SE. $\frac{1}{4}$ Sec. 27, Tp. 2, Rge. 26, W. 4th Mer., at B. Layton's ranch.*Records available.*—May 25, 1913, to January 31, 1914.*Gauge.*—Vertical staff; zero of gauge maintained at elevation 88 14 feet during 1913-14.*Bench-mark.*—Permanent iron bench-mark; assumed elevation, 100.00 feet; located on the left bank about 300 feet below the gauge.*Channel.*—Straight and quite uniform, with a flat rock bed; not liable to shift.*Discharge measurements.*—Made by wading at all ordinary stages, and from temporary cable at very high stages.*Winter flow.*—Obtained through the ice 610 feet below the gauge.*Observer.*—B. Layton.

SESSIONAL PAPER No. 25c

DISCHARGE MEASUREMENTS of Lee Creek at Layton's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 3.	J. E. Degnan	18.0	10.80	0.66	2.60	7.2
Jan. 14.	do	18.0	11.30	2.12	2.44	24.0
Jan. 27.	do	16.0	9.12	1.12	3.03	10.2
Feb. 7.	do	13.0	8.60	0.81	2.37	6.9
Feb. 28.	do	14.0	7.40	1.10	3.90	8.2
Mar. 7.	do	10.1	10.20	1.52	3.60	14.5
Mar. 17.	O. H. Hoover	43.1	27.10	0.98	2.88	26.0
April 9.	do	54.0	48.30	1.89	2.17	92.0
May 9.	do	65.4	78.20	2.50	2.43	195.0
May 12.	do	77.8	64.50	2.16	2.31	139.0
May 25.	do	78.5	64.10	1.96	2.30	125.0
June 19.	do	48.5	37.20	2.00	2.13	75.0
July 8.	do	32.0	24.70	1.73	1.95	43.0
July 25.	do	23.3	12.40	1.47	1.70	18.3
Aug. 8.	do	19.7	8.34	1.18	1.58	9.9
Aug. 26.	do	25.5	17.00	1.43	1.79	24.0
Sept. 10.	do	20.1	9.24	1.28	1.62	11.8
Sept. 29.	do	20.0	9.62	1.23	1.63	11.8
Oct. 20.	do	57.7	57.80	1.97	2.27	114.0
Nov. 21.	do	61.0	63.80	0.88	2.24	56.0
Nov. 30.	do	21.0	11.20	1.19	1.67	13.3
Dec. 23.	do	20.5	12.00	1.66	2.31	19.9

DAILY GAUGE HEIGHT AND DISCHARGE of Lee Creek at Layton's Ranch, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	2.94	7.2 ^b		11.6	3.93	9.5	2.98	31	2.13	76	2.28	122
2.	2.57	7.2	2.64	11.9	3.93	11.2	2.64 ^a	34	2.19	92	2.27	118
3.	2.58	7.2		11.6	3.88 ^a	12.6	2.30	38	2.28	122	2.27	118
4.	2.55	9.0	2.51	10.0	3.83	13.9	2.23	41	2.34	149	2.26	115
5.	2.74	12.2	2.44	8.0	3.73 ^a	15.0	2.21 ^a	44	2.37	165	2.23	104
6.	2.69	18.0	2.36	6.6	3.63	16.0	2.19 ^b	47	2.35	154	2.21	98
7.	2.68	20.0	2.35	6.9	3.60	16.5	1.99	49	2.33	144	2.20	94
8.	2.63	21.0	2.38	8.0	3.58	16.9	1.98 ^a	47	2.31	134	2.18	89
9.		21.0	2.39	10.6	3.50 ^a	16.8	1.96	44	2.35	154	2.16	84
10.	2.56	21.0	2.40	11.8	3.43	16.8	2.01	52	2.33 ^a	144	2.14	79
11.		21.0	2.41	11.3	3.43 ^a	17.2	2.09	67	2.31	134	2.14	79
12.	2.48	21.0		11.1	3.43	18.6	2.03 ^a	56	2.30	129	2.14	79
13.		23.0	2.42	12.0	3.26 ^a	21.0	1.97	46	2.32	139	2.13 ^a	76
14.	2.42	24.0	2.54	13.2	3.09 ^a	23.0	2.02	54	2.31	134	2.13	76
15.		24.0	2.60	13.9	2.93	24.0	2.25	112	2.29	126	2.12	74
16.	2.56	24.0	2.67	13.8	2.91 ^a	25.0	2.24 ^a	108	2.27	118	2.12	74
17.		22.0	2.74	12.7	2.89	25.0	2.22	101	2.26 ^a	115	2.12 ^a	74
18.	2.66	19.5		10.2	2.83	26.0	2.14	79	2.25	112	2.13	76
19.	2.71	16.5	2.91	7.2	2.78	26.0	2.22	101	2.25	112	2.13	76
20.	2.76	14.3		5.6	2.80 ^a	26.0	2.35	154	2.26	115	2.13	76
21.		13.9	3.10	5.2	2.83	25.0	2.37	163	2.26	115	2.14	79
22.	2.85	13.8	3.23	5.5	2.87	25.0	2.34 ^a	149	2.27	118	2.15	82
23.		13.6		5.7	2.88 ^a	25.0	2.32	139	2.28	122	2.15	82
24.	2.95	13.0	3.47	6.0	2.89	24.0	2.28	122	2.29 ^a	126	2.25	112
25.		12.1		6.4	2.95	23.0	2.26 ^a	115	2.30	129	2.30	129
26.	2.99	11.2	3.67	6.9	2.99 ^a	23.0	2.24 ^a	108	2.31	134	2.34	149
27.	3.01	10.2	3.77	7.3	3.03	23.0	2.23	104	2.30	129	2.30	129
28.		9.1	3.88	8.2	2.97 ^a	24.0	2.20	94	2.29	126	2.25	112
29.	2.89	8.6			2.90 ^a	25.0	2.17 ^a	86	2.28	122	2.15	82
30.	2.81	9.2			2.83	26.0	2.14	79	2.28	122	2.11	72
31.	2.73	10.3			2.96	28.0			2.28 ^a	122		

^a Gauge height interpolated.^b to ^b Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Lee Creek at Layton's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.06	61.0	1.62	12.2	1.63a	12.8	1.63	12.8	2.02	54.0	2.19	13.8
2.....	2.02	54.0	1.62	12.2	1.63	12.8	1.63	12.8	2.04	58.0	2.24	14.0
3.....	1.98	47.0	1.61	11.6	1.62	12.2	1.64	13.4	2.05	60.0	2.21	14.0
4.....	1.96	44.0	1.61	11.6	1.62	12.2	1.66	14.6	2.06	61.0	2.16	13.3
5.....	1.98	47.0	1.60	11.0	1.66	14.6	1.70	17.0	2.06	61.0	2.19a	13.2
6.....	1.97a	46.0	1.60	11.0	1.69	16.4	1.74	20.0	2.07	63.0	2.22	13.5
7.....	1.96a	44.0	1.60	11.0	1.71	17.8	1.78	23.0	2.08	65.0	2.21	14.0
8.....	1.95	43.0	1.60	11.0	1.70	17.0	1.82	27.0	2.08	65.0	2.21	14.1
9.....	1.96a	44.0	1.63	12.8	1.70	17.0	1.88	34.0	2.10	69.0	2.23	14.1
10.....	1.97a	46.0	1.64	13.4	1.68	15.8	1.92	39.0	2.10	69.0	2.26	14.0
11.....	1.97	46.0	1.65	14.0	1.68	15.8	1.95	43.0	2.12	74.0	2.29	14.3
12.....	1.96	44.0	1.63	12.8	1.77	23.0	1.97	46.0	2.14	79.0	2.29	15.2
13.....	1.95	43.0	1.60	11.0	1.76	22.0	1.99	49.0	2.18	89.0	2.30a	15.9
14.....	1.94	42.0	1.58	10.0	1.75	21.0	2.19	92.0	2.20	94.0b	2.30	16.0
15.....	1.93	40.0	1.56	9.0	1.80	25.0	2.29	126.0	2.20	90.0	2.30	16.0
16.....	1.92	39.0	1.55	8.5	1.78	23.0	2.40	178.0	2.20a	86.0	2.31	16.7
17.....	1.90	36.0	2.06	61.0	1.76	22.0	2.36	158.0	2.20	80.0	2.31	17.8
18.....	1.89	35.0	1.95	43.0	1.75	21.0	2.32	139.0	2.20	74.0	2.31	17.2
19.....	1.87	33.0	1.90	36.0	1.74	20.0	2.30	129.0	2.21	67.0	2.31	16.8
20.....	1.85	30.0	1.85	30.0	1.72	18.6	2.27	118.0	2.22	62.0	2.30a	18.0
21.....	1.82	27.0	1.78	23.0	1.70	17.0	2.20	94.0	2.24	56.0	2.30	19.1
22.....	1.79	24.0	1.72	18.6	1.68	15.8	2.11	72.0	2.22	51.0	2.31	19.8
23.....	1.76	22.0	2.02	54.0	1.66	14.6	2.09	67.0	2.22	44.0	2.33	19.9
24.....	1.74	20.0	1.98	47.0	1.66	14.6	2.08	65.0	2.20	38.0	2.33	19.7
25.....	1.70	17.0	1.90	36.0	1.65	14.0	2.07	63.0	2.15	32.0	2.36a	18.3
26.....	1.68	15.8	1.76	22.0	1.65	14.0	2.06	61.0	2.00	35.0	2.38	17.5
27.....	1.66	14.6	1.70	17.0	1.64	13.4	2.05	60.0	1.95	43.0	2.41	18.0
28.....	1.65	14.0	1.66	14.6	1.64	13.4	2.04	58.0	1.92	39.0	2.43	18.6
29.....	1.64	13.4	1.64	13.4	1.63	12.8	2.04	58.0	2.00	21.0	2.48	19.4
30.....	1.63	12.8	1.62	12.2	1.63	12.8	2.03	56.0	2.07	13.3	2.51	19.7
31.....	1.63	12.8	1.62a	12.2	.....	.....	2.02	54.0	.....	.....	2.54	20.0b

a Gauge height interpolated.
b to b Ice conditions.

MONTHLY DISCHARGE of Lee Creek at Layton's Ranch, for 1914.
(Drainage area 92 square miles.)

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	24.0	7.2	15.4	0.167	0.19	947
February.....	13.9	5.2	9.2	0.100	0.10	511
March.....	26.0	9.5	21.0	0.228	0.26	1,291
April.....	163.0	31.0	82.0	0.891	0.99	4,879
May.....	163.0	76.0	127.0	1.380	1.59	7,809
June.....	149.0	72.0	94.0	1.020	1.14	5,593
July.....	61.0	8.5	24.0	0.370	0.43	2,091
August.....	61.0	8.5	30.0	0.217	0.25	1,230
September.....	25.0	12.2	16.7	0.182	0.20	994
October.....	178.0	12.8	65.0	0.707	0.82	3,997
November.....	94.0	13.3	60.0	0.652	0.73	3,570
December.....	20.0	13.2	16.5	0.179	0.21	1,014
The year.....	.....	.....	.....	.....	6.91	33,926

LEE CREEK AT CARDSTON.

Location.—On the NW. $\frac{1}{4}$ Sec. 10, Tp. 3, R $\frac{1}{2}$ e. 25, W. 4th Mer.

Records available.—June 28, 1909, to July 13, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 87.91 feet during 1913-14. For previous gauge data see previous reports.

SESSIONAL PAPER No. 25c

Bench-mark.—Permanent iron bench-mark.

Discharge measurements.—Made by wading.

Winter flow.—Records are discontinued during the frozen season.

Observer.—O. Williams.

Remarks.—Daily records were discontinued at this station on July 13, 1914, and the station abandoned in favour of the station at Layton's ranch. (See Lee Creek at Layton's ranch.)

DISCHARGE MEASUREMENTS of Lee Creek at Cardston, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 21.....	O. H. Hoover.....	19.0	25.6	1.51	1.37	39.0
April 4.....	do.....	28.3	36.7	1.93	1.47	71.0
April 18.....	do.....	29.9	42.9	1.90	1.38	82.0
May 4.....	do.....	69.0	63.9	2.11	1.56	135.0
May 22.....	do.....	69.0	58.7	2.00	1.52	117.0
June 8.....	do.....	29.3	43.1	1.71	1.36	74.0
June 20.....	do.....	29.0	42.5	1.70	1.35	72.0
July 1.....	do.....	24.5	29.3	1.86	1.28	55.0
July 11.....	do.....	27.7	34.0	0.99	1.15	34.0
Aug. 6.....	do.....	21.0	13.4	0.69	0.90	9.2
Sept. 1.....	do.....	14.8	12.0	1.15	1.05	13.9
Sept. 30.....	W. A. Burton.....	15.9	12.6	1.04	1.03	13.0
Oct. 7.....	O. H. Hoover.....	17.7	18.1	1.87	1.17	33.8
Oct. 19.....	do.....	69.5	63.4	2.27	1.59	144.0
Nov. 7.....	do.....	42.0	30.5	1.82	1.29	55.8

DAILY GAUGE HEIGHT AND DISCHARGE of Lee Creek at Cardston, for 1914.

DAY.	March.		April.		May.		June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.43	60	1.49	110	1.44	95	1.28	56
2.....			1.35	44	1.55	130	1.44	95	1.35	71
3.....			1.19	22	1.55	130	1.55	130	1.33	67
4.....			1.47	71 ^b	1.54	127	1.49	110	1.32	64
5.....			1.37	56	1.55	130	1.45	98	1.29	58
6.....			1.32	50	1.55	130	1.45	98	1.25	50
7.....			1.26	42	1.55	130	1.44	95	1.23	46
8.....			1.35	64	1.60	148	1.37	56	1.19	38
9.....			1.35	69	1.70	186	1.34	69	1.19	38
10.....			1.24	48	1.71	190	1.34	69	1.13	30
11.....			1.38	79	1.65	166	1.34	69	1.12	28
12.....			1.45	98	1.65	166	1.33	67	1.13	30
13.....			1.50	113	1.65	166	1.51	116	1.11 ^a	27
14.....			1.50	113	1.64	162	1.60	148		
15.....			1.55	130	1.63	159	1.46	101		
16.....			1.50	113	1.60	148	1.45	98		
17.....			1.45	98	1.58	141	1.43	92		
18.....			1.41	87	1.55	130	1.40	84		
19.....			1.38	79	1.55	130	1.35	71		
20.....			1.64	162	1.56	134	1.34	69		
21.....	1.39	39 ^b	1.45	98	1.54	127	1.32	64		
22.....	1.35	35	1.47	104	1.52	120	1.30	60		
23.....	1.26	25	1.49	110	1.51	116	1.26	52		
24.....	1.76	144	1.54	127	1.52	120	1.26	52		
25.....	1.69	123	1.49	110	1.50	113	1.50	113		
26.....	1.64	107	1.45	98	1.48	107	1.54	127		
27.....	1.91	212	1.41	87	1.46	101	1.36	74		
28.....	1.86	190	1.42	90	1.45	98	1.32	64		
29.....	1.92	221	1.41	87	1.44	95	1.32	64		
30.....	1.75	152	1.40	84	1.43	92	1.32	64		
31.....	1.43	60			1.43	92				

^a Station abandoned.

^b Ice conditions March 21 to April 4.

MONTHLY DISCHARGE of Lee Creek at Cardston, for 1914.

(Drainage area 118 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (21-31)	221	25	119	1.010	0.41	2,596
April	162	22	86	0.729	0.81	5,117
May	190	92	132	1.120	1.29	8,116
June	148	52	86	0.729	0.81	5,117
July (1-13)	71	27	46	0.390	0.19	1,186
The period					3.51	22,132

PINEPOUND CREEK AT PACKARD'S FARM.

Location.—On the NE. $\frac{1}{4}$ Sec. 29, Tp. 4, Rge. 24, W. 4th Mer.*Records available.*—April 30, 1914, to October 31, 1914.*Gauge.*—Vertical staff; zero of gauge maintained at elevation of 90.66 feet during 1914.*Bench-mark.*—Temporary iron bench-mark located 70 feet northeast of the staff gauge on the right bank; assumed elevation, 100.00 feet.*Channel.*—Composed of sand, gravel, and small stones; not liable to shift on account of the good control located about 100 feet below the gauge.*Discharge measurements.*—Made by wading.*Winter flow.*—Station discontinued during winter season.*Observer.*—Earl O. Packard.

DISCHARGE MEASUREMENTS of Pinepound Creek at Packard's Farm, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 30	O. H. Hoover	60.4	73.40	2.98	3.73	218.0
May 1	do	37.7	36.50	2.42	3.36	88.0
May 20	do	35.3	31.40	1.64	3.26	52.0
June 10	do	34.3	22.52	1.76	3.12	40.0
June 30	do	15.8	12.80	1.25	2.92	16.0
July 14	do	24.0	12.90	1.02	2.90	13.1
July 24	do	15.5	12.36	0.88	2.84	10.9
Aug. 7	do	16.9	9.52	0.71	2.74	6.7
Aug. 13	do	17.2	8.94	0.61	2.73	5.5
Aug. 28	do	17.5	8.66	0.62	2.72	5.4
Sept. 16	do	14.0	4.43	0.96	2.71	4.3
Sept. 24	do	14.2	4.58	0.98	2.70	4.4
Oct. 2	do	14.7	4.94	0.93	2.71	4.6

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DAILY GAUGE HEIGHT AND DISCHARGE of Pinepound Creek at Packard's Farm, for 1914.

Day.	April.		May.		June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			3.45	114.0	3.18	50.0	2.86	12.4
2.....			3.46	117.0	3.20	53.0	2.87	13.0
3.....			3.22	57.0	3.19	51.0	2.87	13.0
4.....			3.25	63.0	3.24	61.0	2.89	14.4
5.....			3.22	57.0	3.15	45.0	2.88	13.7
6.....			3.20	53.0	3.15	45.0	2.88	13.7
7.....			2.85	11.7	3.15	45.0	2.87	13.0
8.....			2.84	11.1	3.14	43.0	2.87	13.0
9.....			2.83	10.5	3.13	42.0	2.88	13.7
10.....			2.84	11.1	3.12	40.0	2.88	13.7
11.....			2.82	9.8	3.11	39.0	2.89	14.4
12.....			2.79	8.2	3.11	39.0	2.89	14.4
13.....			2.78	8.0	3.12	40.0	2.90	15.0
14.....			2.87	13.0	3.10	37.0	2.90	15.0
15.....			3.29	72.0	3.11	39.0	2.90	15.0
16.....			3.29	72.0	3.11	39.0	2.90	15.0
17.....			3.17	48.0	3.11	39.0	2.90	15.0
18.....			3.17	48.0	3.10	37.0	2.91	15.1
19.....			3.17	48.0	3.10	37.0	2.87	13.0
20.....			3.16	47.0	2.95	19.5	2.90	15.0
21.....			3.16	47.0	2.92	16.8	2.90	15.0
22.....			3.18	50.0	2.93	17.7	2.90	15.0
23.....			3.17	48.0	2.92	16.8	2.88	13.7
24.....			3.18	50.0	2.91	15.1	2.85	11.8
25.....			3.19	51.0	2.91	15.1	2.85	11.8
26.....			3.16	47.0	2.88	13.7	2.84	11.1
27.....			3.17	48.0	2.88	13.7	2.83	10.5
28.....			3.17	48.0	2.90	15.0	2.82	9.8
29.....			3.16	47.0	2.90	15.0	3.40	99.0
30.....	3.73	219	3.19	51.0	2.92	16.8	2.85	11.7
31.....			3.20	53.0			2.75	6.0

DAILY GAUGE HEIGHT AND DISCHARGE of Pinepound Creek at Packard's Farm, for 1914.

—Concluded.

DAY.	August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.75	6.0	2.75	6.0	2.71	4.8
2.....	2.75	6.0	2.74	5.7	2.71	4.8
3.....	2.75	6.0	2.74	5.7	2.73	5.4
4.....	2.75	6.0	2.74	5.7	3.50	129.0
5.....	2.74	5.7	2.74	5.7	3.51	133.0
6.....	2.74	5.7	2.74	5.7	2.81	9.2
7.....	2.74	5.7	2.73	5.4	2.79	8.0
8.....	2.74	5.7	2.73	5.4	2.77	7.0
9.....	2.75	6.0	2.73	5.4	2.78	7.5
10.....	2.74	5.7	2.74	5.7	2.70	4.5
11.....	2.73	5.4	2.74	5.7	2.70	4.5
12.....	2.74	5.7	2.74	5.7	2.66	3.3
13.....	2.73	5.4	2.73	5.4	2.65	3.0
14.....	2.73	5.4	2.73	5.4	2.65	3.0
15.....	2.72	5.1	2.74	5.7	2.68	3.9
16.....	2.73	5.4	2.74	5.7	2.80	8.5
17.....	2.73	5.4	2.71	4.8	2.82	9.8
18.....	2.74	5.7	2.71	4.8	2.82	9.8
19.....	2.73	5.4	2.71	4.8	2.86	12.4
20.....	2.73	5.4	2.71	4.8	2.80	8.5
21.....	2.73	5.4	2.71	4.8	2.76	6.5
22.....	2.73	5.4	2.71	4.8	2.70	4.5
23.....	2.73	5.4	2.71	4.8	2.65	3.0
24.....	2.73	5.4	2.70	4.5	2.64	2.8
25.....	2.74	5.7	2.70	4.5	2.64	2.8
26.....	2.73	5.4	2.71	4.8	2.64	2.8
27.....	2.73	5.4	2.71	4.8	2.63	2.6
28.....	2.73	5.4	2.71	4.8	2.62	2.4
29.....	2.73	5.4	2.70	4.5	2.62	2.4
30.....	2.74	5.7	2.71	4.8	2.60	2.0
31.....	2.75	6.0			2.60	2.0

MONTHLY DISCHARGE of Pinepound Creek at Packard's Farm, for 1914.

(Drainage area *a* square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (30).....	219		219.0			434
May.....	117	8.0	45.8			2,816
June.....	61	13.7	33.2			1,975
July.....	99	6.0	16.0			984
August.....	6	5.1	5.6			344
September.....	6	4.5	5.2			310
October (1-31).....	133	2.0	13.3			818
The period.....						7,681

a Owing to the fact that the greater portion of the discharge is waste water from the Alberta Railway and Irrigation Company's Canal the drainage area has not been taken out.

ALBERTA RAILWAY AND IRRIGATION COMPANY CANAL AT SPRING COULEE.

Location.—On the NW. $\frac{1}{4}$ Sec. 28, Tp. 4, Rge. 23, W. 4th Mer.

Records available.—May 1, 1914, to August 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at elevation 94.38 feet during 1914.

Bench-mark.—Top of a large boulder inset in the right bank 10 feet from the gauge; assumed elevation, 100.00 feet.

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Channel.—Straight for 300 feet above and 150 feet below the cable. The banks are steep and high, and the stream bed consists of sand, clay and small stones, liable to shift.

Discharge measurements.—Made from a temporary cable structure located 150 feet below the gauge.

Observer.—E. M. Eby.

Remarks.—Records may be obtained only during the irrigating season.

DISCHARGE MEASUREMENTS of Alberta Railway and Irrigation Company Canal at Spring Coulee, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 1.....	O. H. Hoover.....	41.0	68.6	2.88	2.92	197
May 20.....	W. A. Burton.....	37.5	108.0	3.77	3.77	405
July 14.....	O. H. Hoover.....	51.2	138.0	4.50	4.69	623
July 24.....	do.....	50.9	139.0	4.43	4.66	615
Aug. 7.....	do.....	50.0	130.0	4.19	4.42	548
Aug. 15.....	do.....	49.5	121.0	4.01	4.15	487
Aug. 28.....	do.....	50.0	124.0	4.10	4.20	511
Sept. 16.....	do.....	47.5	89.8	3.30	3.47	296
Sept. 24.....	do.....	48.0	103.0	3.57	3.65	368
Oct. 2.....	do.....	49.5	103.0	3.45	3.72	357

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company Canal at Spring Coulee, for 1914.

DAY.	May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.92	196	4.10	469
2.....	2.97	207	4.12	474
3.....	3.36	292	4.20	495
4.....	3.49	321	4.32	526
5.....	3.95	430	4.38	542
6.....	3.48	319	4.60	599
7.....	3.80	394	4.62	604
8.....	3.92	423	4.64	609
9.....	3.91	420	4.70	625
10.....	3.87	411	4.63	607
11.....	3.89	416	4.69	622
12.....	3.87	411	4.68	620
13.....	3.91	420	4.69	622
14.....	3.89	416	4.67	617
15.....	3.92	423	4.71	628
16.....	3.91	420	4.73	633
17.....	3.93	426	4.71	628
18.....	3.93	426	4.70	625
19.....	3.93	426	4.69	622
20.....	3.96	433	4.72	630
21.....	3.95	430	4.71	628
22.....	3.91	420	4.69	622
23.....	3.95	430	4.72	630
24.....	3.98	438	4.72	630
25.....	3.97	436	4.70	625
26.....	3.96	433	4.71	628
27.....	3.98	438	4.70	625
28.....	3.98	438	4.72	630
29.....	4.02	448	4.73	633
30.....	4.05	456	4.74	635
31.....	4.08	464		

DAILY GAUGE HEIGHT AND DISCHARGE of Alberta Railway and Irrigation Company Canal
at Spring Coulee, for 1914.—*Conclud. d.*

DAY.	July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	4.75	638	4.29	518
2.....	4.73	633	4.32	526
3.....	4.74	635	4.34 _a	531
4.....	4.74	635	4.36	537
5.....	4.72	630	4.38	542
6.....	4.73	633	4.40 _b	547
7.....	4.74	635	4.42	552
8.....	4.73	633	4.34 _c	531
9.....	4.71	628	4.26 _d	511
10.....	4.69	622	4.18	490
11.....	4.70	625	4.14	479
12.....	4.74	635	4.16	485
13.....	4.73	633	4.16	485
14.....	4.72	630	4.18	490
15.....	4.73	633	4.15	482
16.....	4.73	633	4.16	485
17.....	4.69	622	4.20	495
18.....	4.71	628	4.13	477
19.....	4.70	625	4.13	477
20.....	4.71	628	4.17	487
21.....	4.72	630	4.15	482
22.....	4.72	630	4.18	490
23.....	4.71	628	4.10	469
24.....	4.66	615	4.12	474
25.....	4.67	617	4.09	466
26.....	4.70	625	4.11	472
27.....	4.62	604	4.12	474
28.....	4.68	620	4.14	479
29.....	4.53	581	4.07	461
30.....	4.51	576	4.10	469
31.....	4.43	555	4.09	466

a to *b* Gauge heights interpolated.

c to *d* Gauge heights interpolated.

MONTHLY DISCHARGE of Alberta Railway and Irrigation Company Canal at Spring Coulee,
for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May.....	464	196	402	.....	.....	24,718
June.....	635	469	603	35,881
July.....	638	555	622	38,245
August.....	552	461	494	30,375
The period.....						129,219

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POTHOLE CREEK NEAR MAGRATH (UPPER STATION).

Location.—On the NW. $\frac{1}{4}$ Sec. 10, Tp. 5, Rge. 22, W. 4th Mer., three and one-half miles southwest of Magrath.

Records available.—April 27, 1914, to October 9, 1914.

Gauge.—Vertical staff; zero of gauge maintained at elevation 93.70 feet during 1914.

Bench-mark.—Temporary iron bench-mark, located on the left bank 70 feet directly across the stream from the staff gauge; assumed elevation, 100.00 feet.

Channel.—Straight for about 100 feet above and 50 feet below gauge, composed of fine gravel and stones, and liable to shift during floods.

Discharge measurements.—Made by wading.

Winter flow.—Station discontinued during winter season.

Observer.—L. A. Harrison.

DISCHARGE MEASUREMENTS of Pothole Creek near Magrath (Upper Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 27.....	O. H. Hoover.....	8.2	2.75	0.730	0.90	2.01
May 20.....	do.....	7.8	1.75	0.446	0.80	0.78
June 9.....	do.....					Nil. ^a
June 29.....	do.....					"
July 13.....	do.....					"
Sept. 16.....	do.....					"

^a Water standing in pools.

DAILY GAUGE HEIGHT AND DISCHARGE of Pothole Creek near Magrath (Upper Station), for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			0.85	1.28	0.60	0.01
2.....			0.85	1.28	0.60	0.01
3.....			0.92	2.40	0.60	0.01
4.....			0.95	2.90	0.58	Nil.
5.....			1.10	5.60	0.56	"
6.....			1.05	4.70	0.54	"
7.....			1.00	3.80	0.52	"
8.....			1.06	4.90	0.48	"
9.....			1.03	4.30	0.47	"
10.....			1.00	3.80		^a
11.....			0.95	2.90		
12.....			0.93	2.50		
13.....			0.90	2.00		
14.....			0.86	1.42		
15.....			0.86	1.42		
16.....			0.84	1.18		
17.....			0.82	0.98		
18.....			0.80	0.79		
19.....			0.80	0.79		
20.....			0.80	0.79		
21.....			0.80	0.79		
22.....			0.80	0.79		
23.....			0.78	0.65		
24.....			0.77	0.59		
25.....			0.78	0.65		
26.....			0.78	0.65		
27.....	0.90	2.00	0.75	0.45		
28.....	0.90	2.00	0.70	0.23		
29.....	0.90	2.00	0.68	0.17		
30.....	0.90	2.00	0.67	0.15		
31.....			0.66	0.12		

^a No flow after June 9.

MONTHLY DISCHARGE of Pothole Creek near Magrath (Upper Station), for 1914.

(Drainage area 162 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (27-30)	2.00	2.00	2.00	0.012	0.002	16
May	5.60	0.12	1.77	0.011	0.012	109
June	0.01	0.00				Nil.
July						"
August						"
September						"
October (1-9)						"
The period					0.014	125

POTHOLE CREEK NEAR MAGRATH (LOWER STATION).

Location.—On the NE. $\frac{1}{4}$ Sec. 1, Tp. 6, Rge. 22, W. 4th Mer., three miles northeast of Magrath.

Records available.—April 28, 1914, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at elevation of 93.90 feet from April 28th to July 13th. Gauge moved 336 feet downstream on July 13th; zero of gauge maintained at elevation of 94.47 feet from July 13th.

Bench-marks.—(1) Temporary iron bench-mark, assumed elevation 100.00 feet, located on the left bank directly across stream from the staff from April 28th to July 13th. (2) Temporary iron bench-mark, assumed elevation 100.00 feet, located on the left bank 50 feet from the staff.

Channel.—Composed of sand, gravel and clay; liable to shift during floods.

Discharge measurements.—Made by wading.

Floods.—Caused by overflow from Alberta Railway and Irrigation Company Canal.

Winter flow.—Stream discontinued during winter season.

Observer.—R. Hyden.

DISCHARGE MEASUREMENTS of Pothole Creek near Magrath (Lower Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
April 28	O. H. Hoover	14.7	3.06	0.64	0.90	1.97
May 20	do	44.0	34.30	2.04	1.81	70.00
June 9	do	44.3	41.20	2.34	1.95	94.00
June 29	do	47.0	40.60	1.94	2.17	79.00
July 13a	do	51.0	57.00	2.32	1.93	132.00
July 24	do	50.0	52.80	2.79	1.86	148.00
Aug. 7	do	51.0	46.80	2.92	1.74	114.00
Aug. 15	do	46.5	34.90	1.89	1.47	66.00
Aug. 28	do	59.0	72.00	3.22	2.14	232.00
Sept. 16	do	47.0	39.40	2.02	1.43	80.00
Sept. 24	W. A. Burton	44.0	33.50	1.83	1.33	61.00

a Station moved downstream on July 13.

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DAILY GAUGE HEIGHT AND DISCHARGE of Pothole Creek near Magrath (Lower Station),
for 1914.

DAY.	April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			2.44	213	2.24	163	2.35	125
2.....			2.31	180	1.95	95	2.30	113
3.....			2.00	105	1.85	76	2.29	111
4.....			2.15	140	1.98	101	2.30	113
5.....			2.20	153	2.00	105	2.35	125
6.....			2.05	117	2.10	128	2.45	150
7.....			2.25	165	3.30	428	2.40	138
8.....			2.25	165	2.50	228	2.40	138
9.....			2.35	190	1.95	95	2.45	150
10.....			2.34	188	2.05	114	4.25	600
11.....			2.34	188	3.80	549	2.45	150
12.....			2.30	178	3.95	580	2.53	170
13.....			1.98	101	4.25	611	1.93 ^a	132
14.....			2.30	178	4.20	636	1.85	120
15.....			1.33	21	2.55	220	1.80	112
16.....			2.13	136	4.32	660	1.95	146
17.....			2.13	136	4.29	649	1.90	139
18.....			1.60	44	2.85	285	1.90	141
19.....			1.58	42	2.35	156	2.00	164
20.....			1.80	68	2.55	203	1.95	156
21.....			1.50	34	4.20	612	1.90	145
22.....			1.72	58	2.35	146	1.90	149
23.....			1.90	85	2.35	142	2.00	172
24.....			1.84	75	2.45	164	1.83	145
25.....			1.85	76	2.35	135	1.85	140
26.....			1.85	76	2.25	107	1.85	136
27.....			2.00	105	2.25	103	1.85	140
28.....	0.90	2.00	1.80	68	2.20	88	1.85	140
29.....	0.90	2.00	1.60	44	2.17	78	1.50	70
30.....	0.88	1.60	3.48	473	2.23	108	1.85	140
31.....			3.50	478			1.80	130

^a Gauge moved 336 feet downstream on July 13.

DAILY GAUGE HEIGHT AND DISCHARGE of Pothole Creek near Magrath (Lower Station),
for 1914.—*Concluded.*

DAY.	August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1	1.80	130	2.00	200	1.30	56
2	3.50	519	2.00	200	1.30	56
3	3.50	519	2.00	200	1.30	56
4	2.00	174	2.00	200	2.15	465
5	1.95	161	2.00	200	4.00	660
6	1.95	161	2.00	200	2.00	200
7	1.95	161	2.00	200	1.50	92
8	1.90	152	1.95	189	1.50	92
9	1.70	109	1.93	185	1.30	56
10	1.60	89	1.95	189	Dry.	Nil.
11	1.60	89	1.90	178	"	"
12	1.59	87	1.95	189	"	"
13	1.60	89	2.00	200	"	"
14	1.60	89	1.90	178	"	"
15	1.55	80	1.65	123	1.30	56
16	1.50	74	1.60	112	1.30	56
17	1.50	76	1.57	106	1.30	56
18	1.50	78	1.55	102	1.30	56
19	1.50	80	1.55	102	1.20	40
20	1.50	82	1.60	112	1.10	27
21	1.53	91	1.50	92	0.90	4
22	1.50	87	1.30	56	.....^a	.....
23	2.00	195	1.30	56	.....	.....
24	2.30	267	1.30	56	.....	.....
25	2.20	242	1.30	56	.....	.....
26	2.00	197	1.50	92	.....	.....
27	2.50	315	1.30	56	.....	.....
28	2.45	304	1.30	56	.....	.....
29	2.40	292	1.33	61	.....	.....
30	2.40	292	1.30	56	.....	.....
31	2.00	200	.....	.....	.....	.....

^a Dry after Oct. 21.

MONTHLY DISCHARGE of Pothole Creek near Magrath (Lower Station), for 1914.

(Drainage area, *a* square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
April (28-30)	2.0	1.6	1.87	11
May	475.0	21.0	138.00	8,485
June	660.0	76.0	259.00	15,412
July	600.0	70.0	152.00	9,346
August	519.0	74.0	177.00	10,883
September	200.0	56.0	133.00	7,914
October	660.0	0.0	65.00	3,997
The period.	.....	.....	.....	56,048

^a Owing to the greater part of the discharge being waste water from the Alberta Railway and Irrigation Company Canal, the drainage area has not been taken out.

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ST. MARY RIVER AT WHITNEY'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 26, Tp. 7, Rge. 22, W. 4th Mer.

Records available.—October 13, 1911, to December 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 87.55 feet during 1911; 89.13 feet during 1912; 89.15 feet during 1913; 88.15 feet during 1914.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet; located near Mr. Whitney's house.

Channel.—Consists of gravel, and is liable to shift.

Discharge measurements.—Made from a cable car located about 2,000 feet downstream from the gauge.

Winter flow.—Obtained through the ice 240 feet downstream from the cable.

Observer.—W. D. Whitney.

DISCHARGE MEASUREMENTS of St. Mary River at Whitney's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 9.....	J. E. Degnan.....	75	89.0	2.83	1.43	252
Jan. 20.....	do.....	85	99.5	2.06	1.43	204
Feb. 5.....	do.....	110	66.2	0.87	1.41	57
Mar. 5.....	do.....	135	250.0	0.99	1.91	248
April 3.....	J. E. Caughey.....	185	242.0	2.04	1.36	496
April 23.....	do.....	236	370.0	2.92	1.73	1,080
May 11.....	do.....	265	502.0	3.66	2.12	1,841
May 30.....	do.....	268	523.6	3.65	2.09	1,912
June 20.....	do.....	303	547.0	3.80	2.14	2,083
July 7.....	do.....	245	422.0	3.17	1.89	1,311
July 21.....	do.....	195	298.0	2.25	1.52	671
Aug. 4.....	do.....	190	261.0	2.21	1.43	577
Aug. 19.....	do.....	190	256.0	2.27	1.41	579
Sept. 1.....	do.....	180	175.0	2.06	1.15	360
Sept. 19.....	do.....	85	104.0	2.08	1.00	218
Oct. 1.....	do.....	185	217.0	2.12	1.30	459
Oct. 21.....	do.....	243	442.0	3.20	1.86	1,415
Nov. 10.....	O. H. Hoover.....	223	357.0	2.82	1.72	1,006
Nov. 24.....	do.....	190	267.0	2.33	1.43	622
Dec. 9.....	do.....	129	339.0	0.44	1.46	148
Dec. 29.....	do.....	100	132.0	1.79	2.02	236

DAILY GAUGE HEIGHT AND DISCHARGE of St. Mary River at Whitney's Ranch, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.89	115 ^b	1.46	108	2.11	235	1.44	608	1.96	1,538	2.09	1,855
2.....	0.91	142	1.44	83	2.06	238	1.45	620	1.99	1,607	2.09	1,855
3.....	0.93	171	1.42	58	2.01	242	1.46	632	1.99	1,607	2.09	1,855
4.....	0.93	196	1.37	56	1.93	248	1.50	680	1.99	1,607	2.09	1,855
5.....	0.93	220	1.41	57	1.92	248	1.35	510	2.02	1,680	2.09	1,855
6.....	1.03	200	1.40	63	1.88	254	1.39	550	1.98	1,584	2.14	1,980
7.....	1.05	230	1.40	68	1.75	263	1.37	530	1.95	1,515	2.12	1,930
8.....	1.07	243	1.39	82	1.65	272	1.43	596	1.95	1,515	2.09	1,855
9.....	1.44	252	1.38	88	1.62	280	1.33	490	1.92	1,446	2.09	1,855
10.....	1.38	244	1.41	94	1.50	290	1.25	415	2.01	1,655	2.12	1,930
11.....	1.42	232	1.45	96	1.43	302	1.22	388	2.12	1,930	2.13	1,955
12.....	1.44	230	1.47	87	1.37	313	1.24	406	2.04	1,730	2.09	1,855
13.....	1.46	239	1.51	83	1.22	327	1.32	480	2.02	1,686	2.09	1,855
14.....	1.46	245	1.56	87	2.16	342 ^a	1.38	540	2.02	1,680	2.07	1,805
15.....	1.46	240	1.56	93	1.60	356	1.46	632	2.01	1,655	2.09	1,855
16.....	1.48	232	1.56	108	1.49	373	1.51	694	2.01	1,655	2.09	1,855
17.....	1.48	222	2.21	155	1.44	391	1.53	722	2.09	1,855	2.14	1,980
18.....	1.45	215	2.26	176	.....	408 ^b	1.60	820	2.09	1,855	2.14	1,980
19.....	1.43	208	2.34	178	1.27	433	1.64	888	2.14	1,980	2.14	1,980
20.....	1.43	204	2.35	168	1.30	460	1.68	956	2.19	2,105	2.17	2,055
21.....	1.43	190	2.31	167	1.28	442	1.71	1,009	2.22	2,184	2.14	1,980
22.....	1.45	187	2.11	176	1.18	356	1.72	1,028	2.24	2,238	2.09	1,855
23.....	1.40	184	1.96	194	1.16	342	1.75	1,047	2.24	2,238	2.05	1,755
24.....	1.40	180	1.94	203	1.06	272	1.74	1,066	2.29	2,373	1.94	1,492
25.....	1.40	177	1.92	212	0.96	202	1.79	1,161	2.29	2,373	1.94	1,492
26.....	1.40	168	1.84	218	0.95	195	1.79	1,161	2.24	2,238	1.94	1,492
27.....	1.45	140	1.81	224	1.16	342	1.82	1,224	2.19	2,105	1.94	1,492
28.....	1.45	100	1.77	230	1.23	397	1.83	1,246	2.14	1,980	1.89	1,378
29.....	1.47	99	.....	.....	1.30	460	1.90	1,400	2.13	1,955	1.89	1,378
30.....	1.48	102	1.38	540	1.93	1,469	2.13	1,955	1.89	1,378
31.....	1.48	112	1.43	596	2.09	1,855

^a Ice jam.^b Ice conditions Jan. 1 to March 18.

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DAILY GAUGE HEIGHT AND DISCHARGE of St. Mary River at Whitney's Ranch, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>F. A.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.84	1,264	1.19	363	1.15	335	1.30	460	1.60	820	1.45	370
2.....	1.79	1,161	1.19	363	1.15	335	1.30	460	1.60	820	1.50	320
3.....	1.74	1,066	1.49	668	1.09	293	1.30	460	1.65	905	1.55	285
4.....	1.74	1,066	1.49	668	1.09	293	1.40	560	1.65	905	1.60	250
5.....	1.74	1,066	1.34	500	1.09	293	1.40	560	1.65	905	1.65	220
6.....	1.79	1,161	1.29	451	1.09	293	1.45	620	1.65	905	1.65	195
7.....	1.79	1,161	1.19	363	1.04	258	1.50	680	1.65	905	1.70	175
8.....	1.94	1,492	1.17	349	1.04	258	1.50	680	1.72	1,028	1.75	160
9.....	1.94	1,492	1.09	293	1.04	258	1.65	905	1.75	1,085	1.75	148
10.....	1.99	1,607	1.09	293	1.05	265	1.75	1,085	1.75	1,085	1.70	133
11.....	2.03	1,705	1.04	258	1.10	300	1.90	1,400	1.75	1,085	1.70	130
12.....	1.94	1,492	0.96	223	1.10	300	1.90	1,400	1.80	1,180	1.80	135
13.....	1.84	1,268	0.96	223	1.05	265	1.90	1,406	1.80	1,180	1.80	140
14.....	1.79	1,161	0.94	188	1.05	265	1.90	1,400	1.82	1,224	1.80	142
15.....	1.79	1,161	0.89	154	1.05	265	1.94	1,492	1.85	1,165c	1.80	148
16.....	1.79	1,161	0.89	154	1.05	265	1.94	1,492	1.85	1,115	1.80	153
17.....	1.74	1,066	0.89	154	1.01	237	1.94	1,492	1.82	1,065	1.90	162
18.....	1.74	1,066	0.89	154	1.00	230	2.00	1,630	1.85	1,015	1.90	170
19.....	1.74	1,066	1.41	572	1.00	230	2.00	1,630	1.85	970	1.90	176
20.....	1.69	973	1.35	510	1.05	265	1.95	1,515	1.85	955	1.85	185
21.....	1.59	806	1.30	460	1.05	265	1.88	1,356	1.85	975c	1.85	195
22.....	1.49	668	1.30	460	1.10	300	1.83	1,246	1.70	990	1.85	212
23.....	1.49	668	1.35	510	1.15	335	1.80	1,180	1.60	820	1.85	227
24.....	1.46	632	1.40	560	1.15	335	1.80	1,180	1.34	500	1.85	233
25.....	1.46	632	1.37	530	1.25	415	1.75	1,085	1.34	500	1.85	234
26.....	1.34	500	1.37	530	1.30	460	1.75	1,085	1.40	560	1.85	230
27.....	1.34	500	1.30	460	1.30	460	1.75	1,085	1.40	560	1.95	229
28.....	1.32	480	1.30	460	1.35	510	1.70	990	1.40	560	2.05	230
29.....	1.29	451	1.24	406	1.35	510	1.65	905	1.35	480	2.02	236
30.....	1.24	406	1.19	363	1.30	460	1.60	820	1.35	417d	2.00	236
31.....	1.19	363	1.15	335	.....	.....	1.60	820	.....	.....	2.05	236d

c to c Ice conditions.

d to d Ice conditions.

MONTHLY DISCHARGE of St. Mary River at Whitney's Ranch, for 1914.

(Drainage area 1,406 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	252	99	191	0.136	0.16	11,744
February.....	230	56	129	0.092	0.10	7,164
March.....	596	236	336	0.239	0.28	20,660
April.....	1,469	388	799	0.568	0.63	47,544
May.....	2,373	1,446	1,851	1.320	1.52	113,812
June.....	2,055	1,378	1,790	1.270	1.42	106,510
July.....	1,705	363	992	0.706	0.81	60,996
August.....	668	154	386	0.274	0.32	23,734
September.....	510	230	318	0.226	0.25	18,922
October.....	1,630	466	1,067	0.759	0.88	65,607
November.....	1,224	417	889	0.632	0.70	52,899
December.....	370	130	203	0.144	0.17	12,482
The year.....	.....	.....	.....	.....	7.24	542,074

MISCELLANEOUS DISCHARGE MEASUREMENTS made in St. Mary River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
May 23...	O. H. Hoover...	St. Mary River...	SW. 23-3-25-4...	97.6	409	5.58	2,282
Aug. 8...	do	do ...	do	64.0	212	1.04	222

MILK RIVER DRAINAGE BASIN.

General Description.

Milk River rises on the eastern slope of the foothills in the Blackfoot Indian Reserve in the United States. Its headwaters run down in two main streams which are known, after entering Canada, as the north and south branches. The north branch runs in a north-easterly direction through the Blackfoot Reserve for a distance of about 15 miles, and then enters Canada near the quarter-mound on the south side of Section 3, Township 1, Range 23, West of the 4th Meridian. From the international boundary the stream continues in a north-easterly direction for about nine miles, when it bends to the east and runs in an easterly direction through the second tier of townships to its junction with the south branch at the centre of Section 20, Township 2, Range 18, West of the 4th Meridian.

The south branch runs to the south and east of, and parallels the north branch for a distance of about 48 miles, as the crow flies, through the Blackfoot Reserve, and then enters Canada near the quarter-mound on the south side of Section 1, Township 1, Range 20, West of the 4th Meridian. From the international boundary it runs in a north-easterly direction to its junction with the north branch. From the junction of the two branches Milk River runs in an easterly direction through the second tier of townships in Canada to the east boundary of Range 7. From this point the river runs in a south-easterly direction to its first point of crossing the international boundary into the United States. This first point of crossing is near the quarter-mound on the south side of Section 3, Township 1, Range 5, West of the 4th Meridian. From this point the river meanders in an easterly direction through Canada and United States to a point on the international boundary about 900 feet west of the east boundary of Section 1, Township 1, Range 5, West of the 4th Meridian, where it finally crosses into the United States. This point is known as the "Eastern Crossing." The length of the course of Milk River in Canada from the western crossing of the north branch to the eastern crossing is 215.3 miles. The length of the course of the south branch in Canada is 24.7 miles.

Throughout its course in Canada from the western crossing of the north branch to the eastern crossing, Milk River runs through a well-defined valley bordered on each side by a range of hills. The whole of its watershed in Canada is bald prairie land. The river receives a number of small tributary creeks along its course, all of which discharge a considerable volume of water during the spring freshets; usually they all dry up by about July 1 and have no considerable discharge again until late in the fall, when some of them have a small flow for perhaps a month before the freeze-up.

The general conditions of flow in the river are such as are typical of all rivers which have a watershed devoid of tree growth; that is, it is subject to extreme floods during the freshet period and to correspondingly low flow during the summer months. From its headwaters to the eastern crossing the total area of the watershed of Milk River is 2,464 square miles. Of this total amount, 1,615 square miles are in Canada and 849 square miles in the United States.

NORTH BRANCH OF MILK RIVER AT PETERS' RANCH.

Location.—NE. $\frac{1}{4}$ Sec. 11, Tp. 1, Rge. 23, W. 4th Mer.

Records available.—July 21, 1909, to December 31, 1914.

Gauges.—Stevens automatic gauge used during open water. Vertical staff used during ice conditions. Zero of gauge maintained at elevation 4,089.57 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; elevation, 4,095.99 feet above mean sea level (Irrigation surveys 1914 datum).

Channel.—Slightly curved at the gauge, and generally winding stream bed consists of clay, gravel and small stone, not liable to shift.

Discharge measurements.—Made by wading at low stages, and from a cable car two miles below at flood periods.

Winter flow.—Obtained through the ice 750 feet below the gauge.

Observer.—Wm. Wheeler.

Remarks.—Location of station and gauge data prior to 1913 may be obtained in previous reports.

DISCHARGE MEASUREMENTS of North Branch of Milk River at Peters' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 13.....	J. E. Degnan.....	18	12 3	1.34	2 00	16.5
Jan. 24.....	do.....	15	9 0	1.36	2 55	12 3
Feb. 10.....	do.....	17	7 6	1 81	3 42	13.5
Feb. 27.....	do.....	17	12.5	1 29	2 93	16 2
Mar. 14.....	W. A. Burton.....	17	18 6	2.30	2 25	43 0
Mar. 27.....	O. H. Hoover.....	19	17 6	1 37	1 97	24 0
April 8.....	do.....	28	28 4	1 50	1 96	43 0
April 22.....	do.....	19	25 4	0 99	1 77	25 0
May 15.....	do.....	21	18 4	1 35	1 75	25 0
May 24.....	W. A. Lamb (U.S.G.S.).....	29	19 0	1 26	1 75	24 0
June 5.....	O. H. Hoover.....	23	17 9	1 30	1 72	23 0
June 21.....	W. A. Lamb (U.S.G.S.).....	23	14 0	1 11	1 64	15 6
June 24.....	O. H. Hoover.....	22	17 5	0 95	1 63	16 5
June 25.....	do.....	27	23 4	1 34	1 84	31 0
June 23.....	do.....	23	20 2	1 12	1 71	23 0
July 17.....	do.....	21	17 0	0 80	1 58	13 6
July 21.....	do.....	21	16 0	0 75	1 56	12 0
July 22.....	W. A. Lamb (U.S.G.S.).....	17	12 0	0 95	1 54	11 4
Aug. 12.....	O. H. Hoover.....	22	17 0	0 80	1 57	13 5
Sept. 3.....	do.....	22	17 0	0 81	1 59	14 1
Sept. 7.....	G.H.Whyte and O.H.Hoover.....	22	16 9	0 82	1 58	13 8
Sept. 10.....	W. A. Lamb (U.S.G.S.).....	21	12 8	1 03	1 60	13 2
Sept. 18.....	O. H. Hoover.....	22	17 8	0 84	1 61	14 9
Oct. 14.....	do.....	37	47 6	2 13	2 46	101 0
Oct. 15.....	do.....	33	40 7	2 71	2 42	110 0
Nov. 13.....	do.....	23	21 5	1 21	1 78	26 0
Nov. 27.....	do.....	28	24 9	1 38	1 89	31 0
Dec. 15.....	do.....	22	14.3	1 10	2 12	15 7

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Milk River at Peters' Ranch,
for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.30	14.0 ^a	2.98	13.3	3.14	16.8	3.10	34.0	1.78	26.0	1.63	16.0
2.....	2.28	13.4	3.08	12.7	3.24	17.3	2.59	33.0 ^a	1.77	26.0	1.64	16.6
3.....	2.31	13.8	3.10	12.0	2.84	18.3	2.52	35.0 ^b	1.78	26.0	1.65	17.2
4.....	2.16	14.2	3.09	11.5	2.66	19.4	3.18	197.0 ^c	1.87	34.0	1.67	18.5
5.....	2.28	15.2	3.07	11.2	2.49	21.0	4.48	517.0	1.88	35.0	1.72	22.0
6.....	2.77	18.0	3.43	11.8	2.43	22.0	3.31 ^d	282.0	2.04	52.0	1.73	23.0
7.....	2.25	17.8	3.54	12.3	2.42	22.0	2.01 ^d	48.0	1.97	44.0	1.70	20.0
8.....	2.11	16.9	3.55	13.1	2.39	22.0	1.96 ^d	43.0	1.90	37.0	1.69	19.8
9.....	2.07	16.2	3.52	13.6	2.90	21.0	1.95 ^d	42.0	1.87	34.0	1.67	18.5
10.....	2.06	15.3	3.70	13.5	3.04	20.0	1.94 ^d	41.0	1.82	30.0	1.65	17.2
11.....	2.07	15.3	3.54	13.3	2.04	42.0	1.93 ^d	40.0	1.79	27.0	1.65	17.2
12.....	2.09	16.2	.....	12.7	2.08	42.0	1.92 ^d	39.0	1.76	25.0	1.65	17.2
13.....	2.08	16.5	.....	13.0	2.38	42.0	1.91 ^d	38.0	1.78	26.0	1.75	24.0
14.....	2.11	16.4	3.99	13.5	2.39	43.0	1.90	37.0	1.76	25.0	1.77	26.0
15.....	2.13	16.4	4.01	14.0	2.39	42.0	1.88	35.0	1.76	25.0	1.70	20.0
16.....	2.12	16.2	3.97	14.0	2.14	43.0	1.81 ^e	29.0	1.74	23.0	1.67	18.5
17.....	2.15	16.2	3.91	13.9	2.10	43.0	1.75 ^e	24.0	1.72	22.0	1.67	18.0
18.....	2.47	15.8	3.82	13.8	2.14	40.0	1.69	19.8	1.71	21.0	1.63	16.5
19.....	2.24	15.3	3.84	13.7	2.29	37.0	1.76	25.0	1.71	21.0	1.60	14.3
20.....	2.31	14.7	3.83	13.4	2.09	37.0	1.85	32.0	1.78	26.0	1.61	14.9
21.....	2.38	14.2	3.83	13.2	2.08	35.0	1.75	24.0	1.80	28.0	1.62	15.5
22.....	2.45	13.7	3.72	13.0	2.18	38.0	1.62	15.5	1.74	23.0	1.62	15.5
23.....	2.52	13.0	3.79	13.7	2.64	38.0	1.77 ^f	26.0	1.73	23.0	1.62	15.5
24.....	2.47	12.3	.....	15.0	2.34	32.0	1.77	26.0	1.74	23.0	1.63	16.0
25.....	2.45	12.4	2.67	16.0	1.68	24.0	1.77	26.0	1.72	22.0	1.75	24.0
26.....	2.85	13.1	2.73	16.2	.....	24.0	1.76	25.0	1.68	19.2	1.77	26.0
27.....	2.93	14.0	3.07	16.2	2.11	24.0	1.76	25.0	1.66	17.9	1.65	17.2
28.....	2.96	12.7	3.04	16.4	2.09	25.0	1.77	26.0	1.65	17.2	1.62	15.5
29.....	2.68	13.2	.....	.....	2.08	27.0	1.81	29.0	1.63	16.0	1.60	14.3
30.....	2.50	14.0	.....	.....	2.10	31.0	1.80	28.0	1.63	16.0	1.62 ^f	15.5
31.....	3.00	13.7	.....	.....	2.88	34.0	.....	.....	1.63	16.0	.....	.....

a to *a* Ice conditions.

b Discharge estimated.

c Slope measurement.

d Gauge heights interpolated from gauge height of April 8.

e Gauge heights interpolated.

f to *f* Gauge heights from automatic gauge.

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DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Milk River at Peter's Ranch,
for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.61	14.9	1.59	13.8	1.61	14.9	1.61	14.9	1.82	30.0	1.74	23.0
2.....	1.59	13.8	1.59	13.8	1.60	14.3	1.67	18.5	1.80	28.0	1.82	30.0
3.....	1.60	14.3	1.57	12.8	1.60	14.3	1.71	21.0	1.81	29.0	1.78	26.0
4.....	1.58	13.3	1.55	11.9	1.59	13.8	1.70	20.0	1.80	28.0	1.70	20.0
5.....	1.66	17.9	1.56	12.4	1.59	13.8	1.74	23.0	1.79	27.0	1.79	27.0
6.....	1.67	18.5	1.54	11.5	1.58	13.3	1.84	31.0	1.75	24.0	1.79	27.0
7.....	1.65	17.2	1.53	11.1	1.59	13.8	1.90	37.0	1.73	23.0	1.84	31.0
8.....	1.62	15.5	1.53	11.1	1.62	15.5	1.81	29.0	1.71	21.0	1.85	32.0
9.....	1.61	14.9	1.55	11.9	1.61	14.9	1.72	22.0	1.70	20.0	2.01 _g	28.0
10.....	1.61	14.9	1.57	12.8	1.58	13.3	1.74	23.0	1.68	19.2	2.05	24.0
11.....	1.62	15.5	1.56	12.4	1.56	12.4	1.73	22.0	1.69	19.8	2.11	22.0
12.....	1.63	16.0	1.56	12.4	1.63	16.0	1.70	20.0	1.70	20.0	.....	21.0
13.....	1.63	16.0	1.59	13.8	1.66	17.9	1.74	23.0	1.72	22.0	2.14	22.0
14.....	1.63	16.0	1.56	12.4	1.61	14.9	2.19	71.0	1.76	25.0	.....	22.0
15.....	1.62	15.5	1.55	11.9	1.58	13.3	2.52	125.0	1.76	25.0	2.12	15.7
16.....	1.64	16.6	1.55	11.9	1.59	13.8	2.43	108.0	1.78	26.0	2.11	15.8
17.....	1.62	15.5	1.75	24.0	1.60	14.3	2.27	82.0	1.83	30.0	.....	16.1
18.....	1.58	13.3	1.84	31.0	1.61	14.9	2.15	66.0	1.83	30.0	2.13	16.2
19.....	1.58	13.3	1.68	19.2	1.61	14.9	2.04	52.0	1.85	32.0	2.13	16.4
20.....	1.58	13.3	1.63	16.0	1.61	14.9	2.00	47.0	1.86	33.0	2.15	16.5
21.....	1.58	13.3	1.61	14.9	1.61	14.9	1.91	38.0	1.85	32.0	2.17	16.5
22.....	1.57	12.8	1.60	14.3	1.62	15.5	1.89	36.0	1.81	29.0	2.16	16.2
23.....	1.59	13.8	1.63	16.0	1.63	16.0	1.88	35.0	1.79	27.0	2.17	15.9
24.....	1.60	14.3	1.76	25.0	1.63	16.0	1.86	33.0	1.77	26.0	.....	15.6
25.....	1.60	14.3	1.69	19.8	1.64	16.6	1.84	31.0	1.87	34.0	2.19	15.3
26.....	1.59	13.8	1.66	17.9	1.62	15.5	1.82	30.0	1.90	37.0	2.17	15.2
27.....	1.60	14.3	1.63	16.0	1.61	14.9	1.81	29.0	1.93	40.0	2.18	15.2
28.....	1.59	13.8	1.61	14.9	1.60	14.3	1.81	29.0	1.85	32.0	2.22	15.4
29.....	1.60	14.3	1.60	14.3	1.61	14.9	1.81	29.0	2.40	103.0	2.20	15.5
30.....	1.60	14.3	1.61	14.9	1.61	14.9	1.81	29.0	2.00	47.0	2.23	15.6
31.....	1.58	13.3	1.60	14.3	.....	.....	1.82	30.0	.....	.....	2.26 _g	15.5

g to *g* Gauge heights from staff gauge; ice conditions.

MONTHLY DISCHARGE of North Branch of Milk River at Peters' Ranch, for 1914.

(Drainage area 101 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	18.0	12.3	14.8	0.147	0.17	910
February.....	16.4	11.2	13.6	0.135	0.14	755
March.....	43.0	16.8	30.4	0.301	0.35	1,869
April.....	517.0	15.5	61.4	0.608	0.68	3,654
May.....	52.0	16.0	26.0	0.257	0.30	1,599
June.....	26.0	14.3	18.3	0.181	0.20	1,089
July.....	18.5	12.8	14.8	0.147	0.17	910
August.....	31.0	11.1	15.2	0.150	0.17	935
September.....	17.9	12.4	14.8	0.147	0.16	881
October.....	125.0	14.9	38.9	0.385	0.44	2,392
November.....	103.0	19.2	30.6	0.303	0.34	1,821
December.....	32.0	15.2	20.1	0.199	0.23	1,236
The year.....	.....	.....	.....	.....	3.35	18,051

NORTH BRANCH OF MILK RIVER AT KNIGHT'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 18, Tp. 2, Rge. 20, W. 4th Mer.

Records available.—July 17, 1909, to August 25, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 90.72 feet during 1909; 90 70 feet during 1910-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of clay, gravel and boulders.

Discharge measurements.—Made by wading at low stages, and from a cable car at flood stages.

Winter flow.—Records are discontinued during the winter.

Observer.—E. Whitney.

Remarks.—Records were not obtained after August 25 on account of no observer being available.

DISCHARGE MEASUREMENTS of North Branch of Milk River at Knight's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 9.....	O. H. Hoover.....	40.1	50.8	2.02	1.61	70.0
April 24.....	do.....	41.5	40.8	0.78	1.15	32.0
May 18.....	do.....	29.0	26.5	1.03	1.11	27.0
June 6.....	do.....	28.5	28.5	0.94	1.09	27.0
July 20.....	do.....	14.8	8.6	1.52	0.90	13.0

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Milk River at Knight's Ranch, for 1914.

DAY.	July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.05	24.0	0.85	10.0
2.....	1.05	24.0	0.85	10.0
3.....	1.04	23.0	0.85	10.0
4.....	1.03	22.0	0.85	10.0
5.....	1.05	24.0	0.83	8.8
6.....	1.03	22.0	0.80	7.0
7.....	1.00	20.0	0.85	10.0
8.....	0.95	16.5	0.85	10.0
9.....	0.95	16.5	0.95	10.5
10.....	0.95	16.5	0.98	18.6
11.....	0.95	16.5	0.98	18.6
12.....	0.94	15.8	0.95	16.5
13.....	0.98	18.6	0.90	13.0
14.....	1.00	20.0	0.90	13.0
15.....	0.95	16.5	0.85	10.0
16.....	0.95	16.5	0.85	10.0
17.....	0.94	15.8	1.30	43.0
18.....	0.94	15.8	1.35	48.0
19.....	0.94	15.8	1.30	43.0
20.....	0.92	14.4	1.25	39.0
21.....	0.90	13.0	1.20	35.0
22.....	0.88	11.8	0.95	16.5
23.....	0.88	11.8	1.20	35.0
24.....	0.88	11.8	1.25	39.0
25.....	0.88	11.8	1.25	39.0
26.....	0.88	11.8
27.....	0.88	11.8
28.....	0.85	10.0
29.....	0.85	10.0
30.....	0.85	10.0
31.....	0.85	10.0

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MONTHLY DISCHARGE of North Branch of Milk River at Knight's Ranch, for 1914.

(Drainage area 230 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
July.....	24	10.0	16.1	0.067	0.077	990
August (1-25).....	48	7.0	19.8	0.083	0.077	982
The period.....					0.154	1,972

NORTH BRANCH OF MILK RIVER NEAR MACKIE'S RANCH.

Location.—SW. $\frac{1}{4}$ Sec. 19, Tp. 2, Rge. 18, W. 4th Mer., about four miles north of the Mackie ranch buildings.

Records available.—July 8, 1909, to November 14, 1910. Discharge measurements only were taken during 1911-14.

Gauge.—Vertical staff; elevation of zero 91.50 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Sand, gravel and rock; control probably permanent.

Discharge measurements.—During low water by wading; during high water from a cable car.

DISCHARGE MEASUREMENTS of North Branch of Milk River near Mackie's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 6.....	J. E. Degnan.....	25.5	34.2	1.38	1.92	47.0
May 21.....	do.....	26.5	35.3	0.96	1.80	33.0
June 26.....	do.....	29.0	20.5	1.26	1.70	26.0
July 21.....	do.....	21.0	10.8	0.99	1.50	10.7
Aug. 6.....	do.....	18.0	8.2	0.92	1.47	7.6
Aug. 23.....	do.....	23.0	11.5	1.18	1.57	13.5
Sept. 11.....	F. R. Steinberger.....	23.2	12.8	1.20	1.60	15.4
Oct. 14.....	J. E. Degnan.....	29.0	19.5	1.81	1.83	35.4
Oct. 26.....	do.....	24.0	21.8	1.77	1.84	38.5

NOTE.—Measurements all taken above regular section.

SOUTH BRANCH OF MILK RIVER AT CROFF'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 29, Tp. 37N, Rge. 9, W. Prin. Mer., Montana, U.S.A.

Records available.—April 13, 1913, to November 8, 1914.

Gauge.—Stevens continuous automatic; elevation of zero maintained at 87.08 feet since establishment.

Bench-mark.—Iron pipe; assumed elevation, 100.00 feet.

Channel.—Gravel.

Discharge measurements.—During high stages by means of cable and car; during ordinary stages by wading.

Remarks.—This station is maintained in conjunction with the United States Geological Survey.

DISCHARGE MEASUREMENTS of South Branch of Milk River at Croff's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 15.	W. A. Lamb (U.S.G.S.)	57.0	37.00	1.89	3.010	70.0
April 10.	O. H. Hoover	74.0	92.90	3.02	3.990	289.0
April 23.	do	62.2	74.30	1.75	3.280	130.0
May 16.	do	42.0	42.60	2.74	3.150	117.0
June 5.	do	36.3	34.40	2.41	2.980	83.0
June 21.	W. A. Lamb (U.S.G.S.)	34.0	18.90	2.00	2.720	38.0
June 26.	O. H. Hoover	38.0	38.70	2.52	3.080	98.0
July 18.	do	25.5	14.50	1.14	2.500	16.6
July 22.	W. A. Lamb (U.S.G.S.)	14.0	6.80	1.47	2.410	10.0
Aug. 13.	O. H. Hoover	15.8	9.36	1.16	2.430	10.8
Sept. 4.	do	14.8	9.33	1.33	2.440	12.4
Sept. 10.	W. A. Lamb (U.S.G.S.)	12.0	8.60	1.84	2.510	15.8
Sept. 19.	O. H. Hoover	20.0	12.60	1.80	2.570	23.0
Oct. 15.	do	73.6	69.10	2.42	3.385	167.0
Nov. 8.	W. A. Lamb (U.S.G.S.)	39.0	25.00	1.72	2.740	43.0
Dec. 18.	B. E. Jones, (U.S.G.S.)	12.0	9.80	1.52	2.480	14.9

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Croff's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			3.18	116	<i>b</i>		2.88	63
2.				128			2.88	63
3.				140			2.90	66
4.			3.37	153			2.91	68
5.			4.21	381			2.95	74
6.			4.35	429			3.01	85
7.			3.84	266			3.00	83
8.			3.67	222			2.90	66
9.			3.90	283			2.85	58
10.			3.89	280			2.81	52
11.			3.90	283			2.81	52
12.			4.52	488			2.78	47
13.			4.47	470			2.89	64
14.			3.98	307			3.22	124
15.	3.00	83	3.76	245	<i>b</i>		3.16	112
16.	2.95	74	3.80	255	3.15	110	3.01	85
17.	2.99	81	3.64	214	3.15	110	2.90	66
18.	3.00	83	3.39	157	3.12	105	2.83	55
19.	2.97	78	3.25	130	3.10	101	2.77	46
20.	3.00	83	3.53	188	3.14	109	2.74	42
21.	2.94	73	3.60	204	3.25	130	2.72	39
22.	2.92	69	3.37	153	3.18	116	2.69	35
23.	3.03	88	3.28	135	3.09	99	2.71	37
24.	3.11	103	3.43	166	3.03	88	2.72	39
25.	3.05	92	3.46	172	3.01	85	2.86	60
26.	3.06	94			2.99	81	3.05	92
27.	3.06	94	<i>a</i>		2.98	80	2.96	76
28.	3.07	96			2.95	74	2.83	55
29.	3.06	94			2.93	71	2.79	49
30.	3.04	90	<i>a</i>		2.91	68	2.75	43
31.	2.99	81			2.89	64		

a to *a* No gauge heights obtained and estimated; mean discharge is 130 sec.-ft.*b* to *b* No gauge heights obtained and estimated; mean discharge is 148 sec.-ft.

MONTHLY DISCHARGE of South Branch of Milk River at Croff's Ranch, for 1913.

(Drainage area 288 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (13-30).....	864	211.0	479.0	1.660	1.11	17,101
May.....	494	194.0	311.0	1.080	1.24	19,123
June.....	386	104.0	196.0	0.680	0.76	11,663
July.....	173	50.0	79.0	0.274	0.32	4,858
August.....	104	22.0	44.0	0.152	0.18	2,705
September.....	40	15.2	22.7	0.079	0.09	1,351
October.....	131	22.0	52.2	0.182	0.21	3,210
November.....	50	20.0	31.2	0.108	0.12	1,856
December.....	37	15.0	19.5	0.068	0.08	1,199
The period.....					4.11	63,066

NOTE.—This table is inserted in this report to correct a table on page 225 of the 1913 report. Corrections have been made to discharge in sec.-ft. per square mile and depth in inches on drainage area to correspond with a corrected drainage area.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Croff's Ranch,
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.71	37.0	2.35	7.0	2.47	14.0	2.43	11	2.65	30
2.....	2.65	30.0	2.34	6.6	2.48	15.0	2.49	15	2.64	29
3.....	2.62	27.0	2.33	6.2	2.43	11.0	2.58	23	2.67	33
4.....	2.59	24.0	2.28	4.6	2.46	13.0	a	37	2.76	44
5.....	2.63	28.0	2.28	4.6	2.47	14.0		42	2.79	49
6.....	2.69	35.0	2.27	4.4	2.46	13.0		51	2.73	40
7.....	2.67	33.0	2.27	4.4	2.46	13.0		25	2.70	36
8.....	2.59	24.0	2.27	4.4	2.48	15.0		22	2.71	37
9.....	2.56	21.0	2.34	6.6	2.53	19.0		23		
10.....	2.54	20.0	2.41	9.7	2.51	17.0		26		
11.....	2.54	20.0	2.45	12.0	2.51	17.0		54		
12.....	2.54	20.0	2.45	12.0	2.55	20.0		53		
13.....	2.52	18.0	2.40	9.0	2.60	25.0	a	68		
14.....	2.50	16.0	2.38	8.2	2.59	24.0	3.03	88		
15.....	2.50	16.0	2.33	6.2	2.59	24.0	3.47	174		
16.....	2.49	15.0	2.29	4.8	2.60	25.0	3.67	222		
17.....	2.50	16.0	2.45	12.0	2.58	23.0	3.61	206		
18.....	2.50	16.0	2.71	37.0	2.59	24.0	3.48	177		
19.....	2.49	15.0	2.78	47.0	2.57	22.0	3.22	124		
20.....	2.46	13.0	2.59	24.0	2.54	20.0	3.08	97		
21.....	2.43	11.0	2.51	17.0	2.53	19.0	2.94	73		
22.....	2.42	10.0	2.46	13.0	2.51	17.0	2.85	58		
23.....	2.40	9.0	2.47	14.0	2.49	15.0	2.79	49		
24.....	2.39	8.6	2.60	25.0	2.48	15.0	2.75	43		
25.....	2.40	9.0	2.69	35.0	2.47	14.0	2.72	39		
26.....	2.38	8.2	2.63	28.0	2.46	13.0	2.71	37		
27.....	2.36	7.4	2.57	22.0	2.42	10.0	2.68	34		
28.....	2.34	6.6	2.52	18.0	2.42	10.0	2.66	32		
29.....	2.35	7.0	2.49	15.0	2.41	9.7	2.64	29		
30.....	2.35	7.0	2.49	15.0	2.40	9.0	2.65	30		
31.....	2.35	7.0	2.48	15.0			2.66	32		

a to a No gauge heights obtained ; discharges estimated.

MONTHLY DISCHARGE of South Branch of Milk River at Croff's Ranch, for 1914.

(Drainage area 288 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (15-31).....	103	69.0	85.6	0.297	0.19	2,887
April.....	488	116.0	220.5	0.762	0.85	13,120
May.....	140	64.0	119.7	0.415	0.48	7,360
June.....	124	35.0	63.2	0.220	0.24	3,761
July.....	37	6.6	17.2	0.060	0.07	1,058
August.....	47	4.4	14.4	0.500	0.06	885
September.....	25	9.0	16.6	0.058	0.06	988
October.....	222	11.0	64.3	0.223	0.26	3,954
November.....	a		36.0	0.125	0.14	2,142
December.....	a		18.0	0.062	0.71	1,107
The period.....					3.06	37,262

a Gauge heights for the first eight days in November were obtained, but it is estimated that the mean flow for the months of November and December was as above shown.

SOUTH BRANCH OF MILK RIVER AT MACKIE'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 31, Tp. 1, Rge. 18, W. 4th Mer.

Records available.—July 14, 1909, to October 31, 1914.

Gauge.—Vertical staff; maintained at original elevation of 86.60 feet.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—Made by wading 100 feet below the gauge at low stages, or from a cable and car at the gauge during high stages. The initial point for sounding is the face of a cedar post located on left bank.

Floods.—Highest water of recent years was in June, 1908.

Winter flow.—Station not maintained during the winter.

Observer.—Mrs. F. Cathro and Mrs. J. D. Levix.

DISCHARGE MEASUREMENTS of South Branch of Milk River Creek at Mackie's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 8	J. E. Degnan	86.0	139.3	1.67	3.38	232.0
May 6	do	89.0	95.8	1.60	2.97	154.0
May 21	do	84.0	77.6	1.45	2.78	113.0
June 7	do	79.0	62.4	1.24	2.54	77.0
June 25	do	68.0	42.8	1.14	2.34	49.0
July 21	do	22.0	8.2	0.99	1.82	8.1
Aug. 23	do	29.0	14.4	1.28	1.97	18.3
Aug. 5	do				1.55	Nil.
Sept. 11	F. R. Steinberger	24.6	9.4	0.97	1.86	9.1
Oct. 14	J. E. Degnan	84.0	63.4	1.28	2.50	81.0
Oct. 26	do	71.0	44.0	0.99	2.35	44.0

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Mackie's Ranch, for 1914.

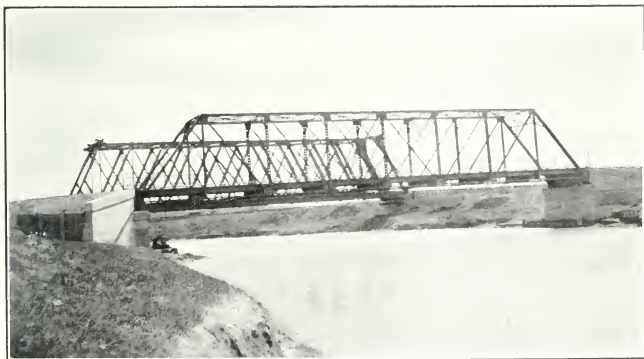
DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1			2.98				2.47	64
2			4.01				2.45	61
3			3.95 ^a				2.44	60
4			3.69	341 ^b			2.44	60
5			3.42	246			2.46	62
6			3.94	436	2.97	156	2.50	68
7			3.57	298			2.54	74
8			3.43	249			2.55	76
9			3.37	250			2.46	62
10			3.23	227			2.45	61
11							2.39	54
12							2.37	51
13							2.44	60
14							2.43	59
15	3.24 ^a						2.86	131
16	3.38						2.70	100
17	3.38						2.55	76
18	3.36						2.45	61
19	3.36						2.36	50
20	3.30				2.73	105	2.30	43
21	3.30				2.78	115	2.26	39
22	3.60				2.90	140	2.16	30
23	3.61				2.80	119	2.29	33
24	3.50				2.74	107	2.18	31
25	3.39				2.70	100	2.33	47
26	3.31				2.65	92	2.33	47
27	2.99				2.63	89	2.54	74
28	2.82				2.59	82	2.50	68
29	2.91				2.56	78	2.36	50
30	2.87				2.54	74	2.30	43
31	2.92				2.50	68		

^a Gauge heights affected by ice.

^b Discharge for April low; control affected by ice.



Gauging Station on the North Branch of Milk River near Mackie's Ranch.
Taken by G. H. Whyte.



Gauging Station on Milk River at Milk River, Alberta. Taken by G. H. Whyte.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of South Branch of Milk River at Mackie's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.27	40.0	1.60	1.0	1.89	9.6	1.83	7.2'
2.....	2.20	33.0	1.61	1.2	1.88	9.2	1.93	11.8
3.....	2.17	31.0	1.57	0.4	1.86	8.4	2.08	23.0
4.....	2.13	27.0	1.58	0.6	1.81	6.4	2.26	39.0
5.....	2.13	27.0	1.55	Nil.	1.85	8.0	2.31	44.0
6.....	2.10	25.0	1.51	"	1.85	8.0	2.39	54.0
7.....	2.14	28.0	1.47	"	1.81	6.4	2.11	26.0
8.....	2.16	30.0	1.45	"	1.84	7.6	2.06	22.0
9.....	2.13	27.0	1.48	"	1.84	7.6	2.08	23.0
10.....	2.06	22.0	1.52	"	1.83	7.2	2.11	26.0
11.....	2.04	20.0	1.55	"	1.87	8.8	2.38	53.0
12.....	2.00	17.0	1.57	0.6	1.94	12.4	2.37	51.0
13.....	1.99	16.2	1.55	Nil.	1.94	12.4	2.48	65.0
14.....	1.98	15.4	1.55	"	1.92	11.2	2.58	81.0
15.....	2.00	17.0	1.49	"	2.01	17.8	2.71	102.0
16.....	1.95	13.0	1.48	"	2.03	19.4	3.18	212.0
17.....	1.92	11.2	1.50	"	2.00	17.0	3.19	215.0
18.....	1.89	9.6	2.21	34.0	1.97	14.6	3.08	184.0
19.....	1.88	9.2	2.14	28.0	2.00	17.0	2.96	153.0
20.....	1.87	8.8	2.26	39.0	2.01	17.8	2.78	115.0
21.....	1.81	6.4	2.15	29.0	2.03	19.4	2.67	95.0
22.....	1.80	6.0	2.03	19.4	1.97	14.6	2.70	100.0
23.....	1.73	4.8	1.97	14.6	1.96	13.8	2.56	78.0
24.....	1.74	3.8	1.99	16.2	1.95	13.0	2.49	67.0
25.....	1.73	3.6	2.00	17.0	1.93	11.8	2.37	51.0
26.....	1.71	3.2	2.04	20.0	1.90	10.0	2.35	49.0
27.....	1.70	3.0	2.15	29.0	1.88	9.2	2.32	45.0
28.....	1.68	2.6	2.09	24.0	1.87	8.8	2.31	44.0
29.....	1.65	2.0	2.00	17.0	1.86	8.4	2.30	43.0
30.....	1.60	1.0	1.99	16.2	1.84	7.6	2.28	41.0
31.....	1.58	0.6	1.92	11.2			2.26	39.0

MONTHLY DISCHARGE of South Branch of Milk River at Mackie's Ranch, for 1914.

(Drainage area 504 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (1-10).....	436.0	227.0	292.0	0.579	0.15	4,060
May (6) (20-31).....	156.0	68.0	102.0	0.202	0.10	2,608
June.....	131.0	30.0	60.0	0.119	0.13	3,570
July.....	40.0	0.6	15.0	0.030	0.04	922
August.....	39.0	Nil.	10.3	0.020	0.02	633
September.....	19.4	6.4	11.4	0.023	0.03	678
October.....	215.0	7.2	70.0	0.139	0.16	4,304
The period.....					0.63	16,775

MILK RIVER AT MILK RIVER.

Location.—On the N.E. $\frac{1}{4}$ Sec. 21, Tp. 2, Rge. 16, W. 4th Mer.*Records available.*—July 1, 1909, to December 31, 1914.*Gauge.*—Vertical staff; maintained at the original elevation of 3,403.39 feet since establishment.*Bench-mark.*—Permanent iron bench-mark; elevation, 3,412.42 feet above mean sea level (Geodetic Survey of Canada).*Channel.*—The stream flows in one channel at all stages; bed consists of sand and fine gravel, and shifts during flood conditions.*Discharge measurements.*—At low stages made by wading; at high stages from the traffic bridge 100 feet above the gauge.*Observer.*—Dan O'Connell.

DISCHARGE MEASUREMENTS of Milk River at Milk River, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 19	J. E. Degnan	27.0	21.30	1.530	2.050	33.00
Jan. 31	do	20.0	7.23	1.560	1.920	11.30
Feb. 16	do	11.0	4.24	0.800	2.420	3.38
Mar. 3	do	26.0	18.60	2.310	3.270	43.00
April 6	do	130.0	345.00	2.440	3.475	844.00
April 11	do	91.0	164.00	2.120	2.420	349.00
April 14	do	129.0	240.00	2.370	2.820	569.00
May 5	do	74.0	93.90	2.300	2.010	216.00
May 7	do	92.0	113.00	1.960	2.020	222.00
May 19	do	90.0	93.00	1.350	1.630	125.00
May 23	do	91.0	117.20	1.420	1.840	166.00
June 6	do	49.0	61.25	1.410	1.420	86.00
June 8	do	52.0	65.75	1.450	1.480	95.00
June 23	do	50.0	49.90	0.830	1.120	42.00
June 27	do	53.0	62.30	1.110	1.340	69.00
July 20	do	46.0	35.65	0.500	0.820	18.00
July 23	do	27.0	16.20	0.980	0.780	15.90
Aug. 4	do	11.0	5.60	0.990	0.590	5.40
Aug. 7	do	12.0	5.60	0.940	0.600	5.18
Aug. 22	do	50.0	42.00	1.050	1.140	44.10
Aug. 24	do	49.0	34.40	0.990	1.110	34.00
Sept. 14	F. R. Steinberger	48.0	30.40	0.940	1.000	29.00
Sept. 10	do	47.0	25.80	0.800	0.870	20.00
Oct. 10	J. E. Degnan	51.0	62.70	1.110	1.450	69.00
Oct. 12	do	54.0	65.20	1.400	1.530	92.00
Oct. 25	do	54.5	66.90	1.350	1.560	91.00
Nov. 9	O. H. Hoover	50.5	60.50	1.490	1.450	91.00
Nov. 23	do	51.5	53.50	1.080	1.000	58.00
Dec. 8	do	52.0	41.60	0.695	1.540	29.00
Dec. 24	do	49.5	29.80	0.660	2.090	19.60

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Milk River, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1	1.85	20.0a	1.93	10.7	3.20	38	2.63	242	1.78	157	1.35	72
2	1.94	22.0	1.97	9.2	3.14	40	3.00	278	1.84	172	1.34	70
3	1.86	20.0	2.20	7.0	3.27	43	2.65	314a	1.85	175	1.30	64
4	1.95	21.0	2.20	7.3	3.25	45	2.40	349	1.85	175	1.30	64
5	2.00	22.0	1.80	7.8	3.24	46	2.40	349	2.00	215	1.32	68
6	2.00	23.0	1.70	6.3	3.14	47	3.50	912	1.90	188	1.42	84
7	2.04	24.0	1.80	4.4	3.25	48	2.98	614	2.00	215	1.44	87
8	2.10	25.0	1.80	2.0	3.22	50	2.50	388	2.10	245	1.48	94
9	2.10	24.0	1.75	1.0	3.23	51	2.30	311	2.02	221	1.40	80
10	1.95	24.0	2.03	2.2	3.10	47	2.70	475	1.95	201	1.35	72
11	2.04	24.0	2.30	4.0	2.98	46	2.50	388	1.90	188	1.30	64
12	2.06	25.0	2.55	5.8	2.95	45	2.50	388	1.85	175	1.30	64
13	2.06	26.0	2.65	7.0	2.95	47	3.20	734	1.80	162	1.35	72
14	2.10	26.0	2.67	7.5	2.98	53	2.90	572	1.70	139	1.35	72
15	2.00	27.0	2.45	4.0	2.95	59	2.45	368	1.68	135	1.40	80
16	2.00	28.0	2.42	3.4	2.70	65	2.20	277	1.64	126	1.73	146
17	2.03	29.0	2.40	4.0	3.00	71	2.20	277	1.62	122	1.50	98
18	2.00	30.0	2.50	5.2	3.10	77	2.10	245	1.62	122	1.36	74
19	2.05	33.0	2.50	7.5	3.08	83	1.90	188	1.63	124	1.30	64
20	2.10	34.0	2.65	10.0	2.80	89	1.80	162	1.70	139	1.25	57
21	2.10	35.0	2.75	13.0	2.40	131	1.76	152	1.70	139	1.15	44
22	1.95	32.0	2.65	12.0	2.25	173	2.05	230	1.80	162	1.12	41
23	1.95	30.0	2.55	11.0	2.00	215	1.85	175	1.75	150	1.14	43
24	1.95	28.0	2.63	15.0	2.45	192	1.75	150	1.65	128	1.15	44
25	1.95	28.0	2.67	18.0	2.47	169	1.85	175	1.60	118	1.24	56
26	1.80	26.0	2.85	23.0	3.10	146	1.93	196	1.56	110	1.30	64
27	1.86	23.0	3.00	29.0	3.10	123	1.80	162	1.50	98	1.32	67
28	1.96	20.0	3.20	34.0	2.95	100	1.75	150	1.50	98	1.51	100
29	1.95	21.0			2.60	136	1.75	150	1.48	94	1.39	78
30	1.91	18.5			2.50	171	1.70	139	1.44	87	1.26	58
31	1.94	11.3			2.50	207			1.40	80		

a Ice conditions Jan. 1 to April 3.

MONTHLY DISCHARGE of Milk River at Milk River, for 1912.

(Drainage area 1,077 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	53	12	37.7	0.035	0.04	2,318
February.....	88	66	77.3	0.072	0.08	4,446
March (1-28).....	852	52	144.0	0.134	0.14	7,997
April (3-30).....	1,504	229	496.0	0.460	0.48	27,546
May.....	1,104	187	293.0	0.272	0.31	18,016
June.....	214	56	105.0	0.097	0.11	6,248
July.....	214	60	126.0	0.117	0.13	7,747
August.....	94	48	61.6	0.057	0.07	3,788
September.....	91	47	64.7	0.060	0.07	3,850
October.....	103	59	81.1	0.075	0.09	4,987
The period.....						86,943

NOTE.—This table is inserted to correct a table appearing on page 260 of the 1912 report. A correction has been made in the acre-feet for March and in the total acre-feet. The remainder of the table is as previously published.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Milk River, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.21	53.0	0.62	6.8	0.97	29.0	0.90	21	1.40	72	1.25	57.0
2.....	1.17	48.0	0.61	6.3	0.94	26.0	0.95	24	1.42	76	1.60	54.0
3.....	1.13	44.0	0.60	5.8	0.92	25.0	1.09	38	1.44	80	1.85	43.0
4.....	1.10	40.0	0.58	4.9	0.90	24.0	1.52a	83	1.44	81	1.65	37.0
5.....	1.12	43.0	0.59	5.4	0.90	24.0	1.95	184	1.45	84	1.60	34.0
6.....	1.07	38.0	0.56	4.0	0.89	23.0	2.14	240	1.50	95	1.60	31.0
7.....	1.05	36.0	0.56	4.0	0.90	24.0	1.71	124	1.58	114	1.61	30.0
8.....	1.06	37.0	0.59	5.4	0.98	30.0	1.51	81	1.48	92	1.56	29.0
9.....	1.07	38.0	0.61	6.3	0.89	23.0	1.50	79	1.45	91	1.70	28.0
10.....	1.05	36.0	0.69	10.3	0.90	24.0	1.40	61	1.42	81	1.71	28.0
11.....	1.02	33.0	0.68	9.8	0.89	23.0	1.40	61	1.35	72	1.74	28.0
12.....	0.98a	30.0	0.70	10.8	0.97	29.0	1.51	81	1.34	70	1.74	28.0
13.....	0.95	27.0	0.69	10.3	1.00	32.0	1.55	89	1.40	80	1.74	30.0
14.....	0.90	24.0	0.67	9.2	1.00	32.0	1.58	96	1.65	74a	1.79	28.0
15.....	0.92	25.0	0.66	8.7	1.04	35.0	1.75	134	1.27	66	1.76	26.0
16.....	0.95	27.0	0.80	16.7	1.05	36.0	2.55	393	1.35	62	1.77	25.0
17.....	0.93	26.0	0.77	14.9	1.04	35.0	2.54	389	1.39	57	1.82	23.0
18.....	0.87	21.0	0.76	14.3	1.01	32.0	2.37	320	1.43	57	1.82	22.0
19.....	0.85	20.0	1.17	48.0	1.00	32.0	2.24	274	1.40	58	1.82	21.0
20.....	0.83	18.7	1.19	50.0	1.00	32.0	2.07	218	1.46	59	1.87	20.0
21.....	0.79	16.1	1.12	43.0	1.00	32.0	2.00	198	1.52	58	1.84	21.0
22.....	0.77	14.9	1.13	44.0	0.98	30.0	1.79	144	1.64	58	1.95	22.0
23.....	0.75	13.7	1.13	44.0	0.98	30.0	1.67	115	1.64	58	1.95	21.0
24.....	0.73	12.5	1.09	40.0	0.97	29.0	1.60	100	1.64	60	1.80	19.6
25.....	0.71	11.4	1.05	36.0	0.95	27.0	1.54	87	1.70	100	1.80	19.5
26.....	0.67	9.2	1.05	36.0	0.95	27.0	1.54	87	1.68	138	1.98	20.0
27.....	0.61	6.3	1.07	38.0	0.91	24.0	1.50	82	1.75	150	2.00	21.0
28.....	0.65	8.2	1.13	44.0	0.91	24.0	1.49	82	1.62	122	2.10	23.0
29.....	0.65	8.2	1.05	36.0	0.90	24.0	1.47	78	1.45	89	2.14	25.0
30.....	0.62	6.8	1.02	33.0	0.90	24.0	1.44	76	1.05	34	2.05	26.0
31.....	0.64	7.7	0.98	30.0	.....	.....	1.43	76	.....	.....	2.00	28.0a

a Ice conditions Nov. 14 to Dec. 31.

MONTHLY DISCHARGE of Milk River at Milk River, for 1914.

(Drainage area 1,104 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	35	11.3	25.0	0.023	0.030	1,537
February.....	34	1.0	9.7	0.009	0.010	538
March.....	215	38.0	92.0	0.083	0.100	5,657
April.....	912	139.0	317.0	0.287	0.320	18,863
May.....	245	80.0	150.0	0.136	0.160	9,223
June.....	146	41.0	71.0	0.065	0.070	4,225
July.....	53	6.3	25.0	0.023	0.030	1,537
August.....	50	4.0	22.0	0.020	0.020	1,353
September.....	36	23.0	28.0	0.025	0.030	1,666
October.....	240	21.0	133.0	0.120	0.140	8,178
November.....	150	34.0	79.7	0.072	0.080	4,742
December.....	57	19.5	28.0	0.025	0.029	1,722
The year.....	.....	.....	.....	.....	1.019	59,241

MILK RIVER AT WRITING-ON-STONE POLICE DETACHMENT.

Location.—On SW. $\frac{1}{4}$ Sec. 35, Tp. 1, Rge. 13, W. 4th Mer.

Records available.—August 2, 1909, to October 31, 1914.

Gauge.—Vertical staff; maintained at the original elevation of 86.13 feet.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of sand, and shifts in changes of stage.

Discharge measurements.—Made from a cable and car during high water, and at low stages by wading.

Observer.—A. P. White.

DISCHARGE MEASUREMENTS of Milk River at Writing-on-Stone Police Detachment, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 3.....	J. E. Degnan.....	126.0 ^a	162.00	2.03	2.89	330.0
April 20.....	do.....	61.0	84.20	2.14	2.43	180.0
May 1.....	do.....	73.0	90.00	1.80	2.24	162.0
May 10.....	do.....	97.0 ^a	116.00	1.94	2.51	225.0
May 18.....	do.....	72.0	72.50	1.77	2.07	128.0
May 23.....	do.....	75.5	93.45	1.82	2.30	170.0
June 2.....	do.....	71.0	61.90	1.38	1.93	85.0
June 9.....	do.....	70.0	62.10	1.50	1.91	93.0
June 22.....	do.....	69.0	48.75	1.29	1.78	63.0
July 2.....	do.....	53.0	42.30	1.45	1.80	61.0
July 15.....	do.....	30.0	21.15	1.20	1.53	26.0
July 24.....	do.....	24.0	14.05	0.99	1.39	13.6
Aug. 1.....	do.....	18.5	6.97	0.75	1.24	5.2
Aug. 8.....	do.....	18.0	5.05	0.49	1.16	2.5
Aug. 19.....	do.....	65.0	24.80	0.76	1.42	18.7
Aug. 25.....	F. R. Steinberger.....	56.0 ^b	35.30	1.20	1.67	42.0
Sept. 5.....	do.....	52.0	23.60	0.87	1.52	20.5
Sept. 16.....	J. E. Degnan.....	69.0	37.30	0.84	1.65	32.0
Oct. 2.....	do.....	50.0	22.20	0.91	1.51	26.4
Oct. 16.....	do.....	74.0	86.00	1.68	2.26	145.0
Oct. 23.....	do.....	80.0	91.60	1.59	2.32	146.0

^a Taken at regular section.

^b Taken above regular section.

All other measurements taken below regular section.



View of Milk River near Writing-on-Stone Police Detachment. Taken by G. H. Whyte.



View of Sandstone Formation in Milk River Valley near Writing-on-Stone Police Detachment. Taken by G. H. Whyte.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Writing-on-Stone Police Detachment, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			2 27	166	2 24	159	1 97	96
2.....			2 74	288	2 32	178	1 93	88
3.....			3 02 ^a	369	2 34	183	1 84	70
4.....			3 02	371	2 33	180	1 84	70
5.....			2 84	316	2 42	203	1 84	70
6.....			2 74	285	2 46	214	1 87	76
7.....			3 43	532	2 42	203	1 89	80
8.....			3 38	507	2 10	198	1 92	86
9.....			3 06	378	2 80	305	1 94	90
10.....			2 86	312	2 50	224	1 97	96
11.....			3 21	430	2 45	211	1 92	86
12.....			3 20	422	2 40	198	1 92	86
13.....			3 01	352	2 34	183	2 00	103
14.....			3 69	637	2 25	161	1 95	92
15.....			3 16	401	2 15	137	1 99	101
16.....			2 92	320	2 18	144	2 13	132
17.....			2 76	272	2 10	125	2 23	156
18.....	2 14	135	2 71	258	2 09	123	2 05	114
19.....	2 11	127	2 57	218	2 05	114	1 93	88
20.....	2 15	137	2 48	193	2 12	130	1 90	82
21.....	2 04	112	2 39	172	2 15	137	1 88	78
22.....	2 36	188	2 32	158	2 18	144	1 78	60
23.....	2 58	245	2 61	235	2 22	154	1 74	53
24.....	2 48	219	2 39	180	2 18	144	1 74	53
25.....	1 99	101	2 39	183	2 14	135	1 78	60
26.....	1 91	84	2 52	220	2 08	121	1 73	52
27.....	1 92	86	2 48	210	2 08	121	1 82	67
28.....	2 69	274	2 38	188	2 05	114	1 90	82
29.....	2 67	269	2 27	163	2 02	107	1 97	96
30.....	2 34	183	2 22 ^b	155	2 00	103	1 95	92
31.....	2 09	123			1 97	96		

^a to ^b Shifting conditions April 3 to April 30.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Writing-on-Stone Police Detachment, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.88	78.0	1.24	5.2	1.58	28.0	1.53	22
2.....	1.80	63.0	1.22	4.5	1.55	24.0	1.53	22
3.....	1.76	56.0	1.22	4.5	1.55	24.0	1.58	26
4.....	1.76	56.0	1.20	3.8	1.55	23.0	1.65	33
5.....	1.72	49.0	1.19	3.5	1.53b	21.0	1.82	54
6.....	1.70	46.0	1.17	2.8	1.51	20.0	1.67	35
7.....	1.67	42.0	1.16	2.5	1.50	19.3	1.94	71
8.....	1.67	42.0	1.15	2.2	1.55	23.0	2.15	112
9.....	1.67	42.0	1.18	3.2	1.57	25.0	2.03	87
10.....	1.66	41.0	1.23	4.9	1.55	23.0	2.00	82
11.....	1.67	42.0	1.35	11.0	1.53	22.0	2.01	84
12.....	1.60	33.0	1.28	7.0	1.52	21.0	1.97	77
13.....	1.54	27.0	1.28	7.0	1.60	28.0	2.03	87
14.....	1.54	27.0	1.29	7.5	1.62	30.0	2.05	91
15.....	1.57	30.0	1.29	7.5	1.64	32.0	2.08	97
16.....	1.55	28.0	1.29	7.5	1.64	32.0	2.15	112
17.....	1.55	28.0	1.27	6.6	1.64	32.0	2.76	277
18.....	1.53	26.0	1.48	21.0	1.64	32.0	2.93	334
19.....	1.50	23.0	1.40	14.2	1.64	32.0	2.84	303
20.....	1.48	21.0	1.41	15.0	1.63	31.0	2.73	268
21.....	1.48	21.0	1.38	12.9	1.62	30.0	2.62	234
22.....	1.48	21.0	1.65	39.0	1.60	28.0	2.45	186
23.....	1.37	12.3	1.70	46.0	1.60	28.0	2.35	159
24.....	1.35	11.0	1.71	48.0	1.60	28.0	2.24	133
25.....	1.35	11.0	1.69a	46.0	1.58	26.0	2.15	112
26.....	1.35	11.0	1.65	39.0	1.55	23.0	2.10	101
27.....	1.33	9.8	1.60	33.0	1.54	22.0	2.07	95
28.....	1.28	7.0	1.60	32.0	1.54	22.0	2.05	91
29.....	1.28	7.0	1.63	35.0	1.53	22.0	2.04	89
30.....	1.25	5.6	1.63	35.0	1.53	22.0	2.00	82
31.....	1.24	5.2	1.60	31.0	.....	.....	2.00	82

a to b Shifting conditions Aug. 25 to Sept. 5.

MONTHLY DISCHARGE of Milk River at Writing-on-Stone Police Detachment, for 1914.

(Drainage area 1,516 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (18-31).....	274	84.0	163.0	0.105	0.06	4,530
April.....	637	155.0	296.0	0.191	0.21	17,613
May.....	305	96.0	160.0	0.103	0.12	9,838
June.....	156	52.0	85.0	0.055	0.06	5,058
July.....	78	5.2	30.0	0.019	0.02	1,845
August.....	48	2.2	17.4	0.111	0.01	1,070
September.....	32	19.3	26.0	0.017	0.02	1,547
October.....	334	22.0	117.0	0.076	0.09	7,194
The period.....	.....	.....	.....	.....	0.59	48,695

MILK RIVER AT PENDANT D'OUREILLE POLICE DETACHMENT.

Location.—On SW. $\frac{1}{4}$ Sec. 21, Tp. 2, Rge. 8, W. 4th Mer.*Records available.*—August 5, 1909, to October 31, 1914.*Gauge.*—Vertical staff; elevation of zero 82.45 feet since establishment.*Bench-mark.*—Permanent iron bench-mark; assumed elevation, 100.00 feet.*Channel.*—Composed of sand, and shifts in change of stage.*Discharge measurements.*—Made from a cable and car during high water; at low stages by wading.*Observers.*—E. N. Bird, F. E. Torpey, and R. G. Lipton.

SESSIONAL PAPER No. 25c

DISCHARGE MEASUREMENTS of Milk River at Pendant d'Oreille Police Detachment, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 20.....	J. E. Degnan.....	39a	52.60	1.08	2.70	57.0
Mar. 31.....	do.....	175	158.00	1.57	3.29	249.0
April 11.....	H. W. Rowley.....	175a	217.00	1.80	3.60	392.0
April 22.....	J. E. Degnan.....	80	116.00	1.80	3.13	209.0
April 27.....	do.....	69a	99.80	1.67	3.07	166.0
May 12.....	do.....	102b	107.00	1.49	3.26	159.0
May 15.....	do.....	127	127.00	1.40	3.14	177.0
May 26.....	do.....	130	109.50	1.32	3.09	145.0
May 29.....	do.....	127	87.40	1.23	2.97	108.0
June 11.....	do.....	125	75.60	1.17	2.91	88.0
June 17.....	do.....	129	76.60	1.17	2.88	89.0
July 6.....	do.....	106	48.95	0.88	2.64	43.0
July 12.....	do.....	43a	35.20	0.77	2.50	27.0
July 27.....	do.....	18a	5.20	0.50	2.14	2.6
July 30.....	do.....	20a	5.20	0.48	2.14	2.4
Aug. 11.....	do.....					Nil.
Aug. 18.....	do.....					Nil.
Aug. 27.....	F. R. Steinberger.....	43a	25.50	1.13	2.55	29.0
Sept. 2.....	do.....	39a	23.10	1.08	2.48	25.0
Sept. 3.....	do.....	37a	21.60	0.92	2.44	19.7
Sept. 21.....	J. E. Degnan.....	41a	26.10	0.88	2.51	23.0
Sept. 28.....	do.....	40a	22.30	0.72	2.45	16.2
Oct. 18.....	do.....	171	206.00	1.65	3.59	341.0
Oct. 20.....	do.....	171	194.00	1.69	3.58	328.0

a Measured below regular station.

b Measured above regular station.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Pendant d'Oreille Police Detachment, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.26	211	2.98	119	2.88	86
2.....			3.25	206	3.00	119	2.88	86
3.....			3.35	252	3.04	127	2.84	77
4.....			3.65	421	3.07	132	2.81	70
5.....			3.64	415	3.10	137	2.77	62
6.....			3.68	440	3.15	150	2.96	106
7.....			3.94	618	3.25	182	3.00	117
8.....			4.13	767	3.24	171	2.87	84
9.....			3.82	531	3.27	180	2.84	77
10.....			3.66	427	3.34	201	2.86	81
11.....			3.60a	390	3.30	180	2.91	93
12.....			3.72	475	3.27	163	2.94	101
13.....			3.74	498	3.20	158	2.88	86
14.....			3.70	481	3.15	160	2.88	86
15.....	3.35	252	3.97	684	3.10	162	2.84	77
16.....	3.29	224	3.80	565	3.10	160	2.88	86
17.....	3.23	198	3.58	427	3.08	150	2.87	84
18.....	3.27	215	3.45	354	3.04	136	3.05	133
19.....	3.23	198	3.42	346	3.04	135	2.98	111
20.....	2.72	53	3.32	294	3.08	148	2.81	70
21.....	2.94	101	3.20	235	3.04	134	2.84	77
22.....	3.26	211	3.14	210	3.05	138	2.84	77
23.....	3.28	220	3.08	184	3.08	146	2.80	68
24.....	3.17	175	3.30	280	3.14	164	2.72	53
25.....	2.61	37	3.20	226	3.13	160	2.84	77
26.....	3.20	186	3.04	158	3.10b	150	2.81	70
27.....	2.83	75	3.06	163	3.04	130	2.77	62
28.....	2.77	62	3.14	187	3.00	117	2.70	50
29.....	2.86	81	3.08	160	2.94	101	2.75	58
30.....	3.54	354	3.01	133	2.92	96	2.85	79
31.....	3.37	262			2.91	93		

a to b Shifting conditions April 11 to May 29.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Pendant d'Oreille Police Detachment,
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.91	93.0	2.10	2.5	2.55	30.0	2.41	16.8
2.....	2.74	56.0	2.03	0.6	2.48	23.0	2.45	20.0
3.....	2.76	60.0	2.03	0.6	2.44	19.2	2.50	25.0
4.....	2.80	68.0	2.02	0.4	2.43	18.4	2.85	79.0
5.....	2.70	50.0	2.01	0.2	2.43	18.4	2.87	84.0
6.....	2.65	43.0	2.00	Nil.	2.44	19.2	2.90	91.0
7.....	2.64	42.0	.....	"	2.44	19.2	2.92	96.0
8.....	2.58	34.0	.....	"	2.46	21.0	2.95	103.0
9.....	2.50	25.0	.....	"	2.42	17.6	3.05	133.0
10.....	2.52	27.0	.....	"	2.45	20.0	2.98	111.0
11.....	2.50	25.0	.....	"	2.45	20.0	2.95	103.0
12.....	2.50	25.0	.....	"	2.45	20.0	2.93	98.0
13.....	2.49	24.0	.....	"	2.43	18.4	2.87	84.0
14.....	2.44	19.2	.....	"	2.65	43.0	2.95	103.0
15.....	2.42	17.6	.....	"	2.58	34.0	2.98	111.0
16.....	2.42	17.6	.....	"	2.64	42.0	3.11	126.0
17.....	2.42	17.6	.....	"	2.53	28.0	3.25	174.0
18.....	2.42	17.6	2.12	3.1	2.45	20.0	3.73	419.0
19.....	2.42a	17.6	2.25	7.0	2.46	21.0	3.83	486.0
20.....	2.42a	17.6	2.37	13.6	2.46	21.0	3.56	319.0
21.....	2.42	17.6	2.30	9.0	2.48	23.0	3.56a	286.0
22.....	2.42	17.6	2.40	16.0	2.48	23.0	3.43	244.0
23.....	2.45	20.0	2.40	16.0	2.50	25.0	3.40	236.0
24.....	2.42	17.6	2.70	50.0	2.51	26.0	3.39	232.0
25.....	2.24	6.7	2.72	53.0	2.53	28.0	3.36	219.0
26.....	2.19	5.2	2.60	36.0	2.48	23.0	3.33	207.0
27.....	2.14	3.7	2.55	30.0	2.45	20.0	3.28	186.0
28.....	2.14	3.7	2.50	25.0	2.44	19.2	3.13	132.0
29.....	2.14	3.7	2.50	25.0	2.43	18.4	3.03	103.0
30.....	2.13	3.4	2.51	26.0	2.43	18.4	2.98	92.0
31.....	2.12	3.1	2.55	30.0	.....	.....	2.93	81.0

a Gauge height interpolated.

MONTHLY DISCHARGE of Milk River at Pendant d'Oreille Police Detachment, for 1914.

(Drainage area 2,169 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (15-31).....	354	37.0	171.0	0.079	0.050	5,760
April.....	767	133.0	358.0	0.165	0.180	21,302
May.....	201	93.0	145.0	0.067	0.077	8,916
June.....	133	50.0	81.0	0.037	0.041	4,820
July.....	93	3.1	26.0	0.012	0.014	1,599
August.....	53	Nil.	11.1	0.005	0.006	682
September.....	43	17.6	23.0	0.011	0.012	1,369
October.....	486	16.8	155.0	0.071	0.082	9,531
The period.....	.....	.....	.....	.....	0.462	53,979

SESSIONAL PAPER No. 25c

MILK RIVER AT SPENCER'S LOWER RANCH.

Location.—South of SE. $\frac{1}{4}$ Sec. 3, Tp. 1, Rge. 5, W. 4th Mer.

Records available.—August 7, 1909, to December 31, 1914.

Gauge.—Gurley automatic water stage register, installed in a wooden shelter 300 feet south of the international boundary, with a staff gauge inside the stilling box and another outside at the mouth of the intake pipe. Gauges are maintained at an elevation of 82.91 feet.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet; located 1,300 feet upstream from the boundary line on the left bank.

Channel.—Composed of gravel, rock and quicksand, and is subject to shifting conditions.

Discharge measurements.—Made by wading at low stages, and by a cable car structure at high stages.

Winter flow.—From December to April the stream is frozen over, and no records of value are obtained.

Observer.—Frank Galloway.

Co-operation.—This station is maintained in conjunction with the United States Geological Survey.

DISCHARGE MEASUREMENTS of Milk River at Spencer's Lower Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 21	W. A. Lamb (U.S.G.S.)	46.0	60.0	1.30	3.30	78.0
Mar. 22	J. E. Degnan	80.0	83.0	1.36	3.25	113.0
Mar. 23	do	92.0	109.0	1.86	3.64	203.0
April 23	do	70.0	92.2	2.00	3.56	185.0
May 1	B. E. Jones (U.S.G.S.)	48.5	94.0	1.63	3.53	153.0
May 27	J. E. Degnan	49.0	63.3	1.89	3.35	120.0
May 29	B. E. Jones (U.S.G.S.)	67.0	72.0	1.55	3.27	112.0
June 16	J. E. Degnan	44.0	49.8	1.20	3.16	85.0
June 24	B. E. Jones (U.S.G.S.)	48.5	37.0	1.54	2.94	57.0
July 8	J. E. Degnan	46.0	34.4	1.15	2.83	40.0
July 14	B. E. Jones (U.S.G.S.)	38.5	39.0	1.03	2.92	40.0
July 14	do do	38.5	38.0	1.05	2.91	40.0
July 28	J. E. Degnan	8.0	2.45	0.83	2.31	2.0
Aug. 13	do					Nil.
Sept. 1	F. R. Steinberger	34.0	14.8	1.06	2.60	15.6
Sept. 4	W. A. Lamb (U.S.G.S.)	33.0	15.9	1.10	2.57	17.5
Sept. 23	J. E. Degnan	35.0	18.1	1.01	2.64	18.3
Oct. 19	G. H. Whyte and J. E. Degnan	134.0	180.0	2.50	4.13	449.0
Oct. 30	B. E. Jones (U.S.G.S.)	38.0	58.0	1.76	3.31	102.0
Dec. 21	do do	31.0a	28.8	0.62	2.97	17.9

NOTE.—Gauge height 2.10 = zero flow.

a Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Spencer's Lower Ranch, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.	<i>a</i>		3.60		4.15		4.47 <i>c</i>	639	3.51	148	3.18	90
2.			3.60		4.25		4.63 <i>c</i>	729	3.48	140	3.19	92
3.			3.60		4.30		4.79 <i>c</i>	818	3.48	140	3.20	94
4.	<i>a</i>		<i>a</i>		4.35		4.95 <i>c</i>	908	3.51	148	3.15	85
5.	3.62				5.11		5.12	1,003	3.56	161	3.14	83
6.	3.67				5.24		4.98	925	3.58	171	3.53	171
7.	4.00				5.28		4.88	869	3.62	184	3.41	138
8.	3.73				5.10		5.13	1,009	3.69	208	3.27	168
9.	3.80				5.10		5.23	1,065	3.72	220	3.16	87
10.	3.90				5.13		5.13	1,069	3.67	205	3.10	77
11.	3.98				5.20		4.13	449	3.79	254	3.12	80
12.	4.10				5.06		3.98	366	3.79	254	3.35	124
13.	4.10				5.04		3.99	371	3.72	224	3.46	151
14.	4.10				<i>b</i>		4.00	376	3.58 <i>d</i>	177	3.59	191
15.	4.10						4.24	510	3.55	167	3.38	131
16.	<i>e</i>						4.37	583	3.50	153	3.16	87
17.	4.07						4.17	471	3.48	148	3.14	83
18.	4.05						3.96	355	3.45	140	3.13	82
19.	4.05						3.81	282	3.46	145	3.16	87
20.	4.03				<i>b</i>		3.90	325	3.47	148	3.27	108
21.	4.00				3.30	78	3.83	291	3.45	143	3.15	85
22.	4.00				3.25	104	3.68	224	3.44	140	3.07	72
23.	3.98				3.75	254	3.58	187	3.44	143	3.02	65
24.	3.90				3.80	277	3.54	171 <i>e</i>	3.42 <i>c</i>	138	2.95	55
25.	3.86				3.92 <i>c</i>	335	3.76	250	3.40	133	3.08	74
26.	3.80				4.05	404	3.60	184	3.38	128 <i>e</i>	3.85	300
27.	3.75				3.93	340	3.51	156	3.35 <i>d</i>	124	3.22	98
28.	3.72		<i>a</i>		4.34	566	3.52	156	3.30	114	3.02	65
29.	3.69				3.99	371	3.62	184	3.27	108	3.01	63
30.	3.65				4.15 <i>c</i>	460	3.57	167	3.24	102	2.98	59
31.	3.60				4.31 <i>c</i>	550			3.22	98		

a Frozen to bottom.*b* Old gauge used at upper section.*c* Gauge height interpolated.*d* Staff gauge readings from May 14 to 27 inclusive.*e* Shifting conditions April 24 to May 26.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Milk River at Spencer's Lower Ranch, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec. ft.
1.....	2.99	61.0	2.25	1.00	2.61	17.8	2.51	10.7	3.22	98	3.27	35.0
2.....	3.05	69.0	2.17	0.35	2.64	20.0	2.53	12.1	3.19	92	3.39	36.0
3.....	3.00	62.0	2.10	Nil	2.64	20.0	2.56	14.2	3.16	87	3.52	34.0
4.....	2.91	49.0	.....	"	2.59	16.3	2.82	38.0	3.14	83	.....	30.0
5.....	2.85	42.0	.....	"	2.55	13.5	3.24	102.0	3.12	80	3.30	26.0
6.....	2.83	40.0	.....	"	2.53	12.1	3.44	145.0	3.12	80	3.28	24.0
7.....	2.82	38.0	.....	"	2.50	10.0	3.56	180.0	3.11	79	3.25	23.0
8.....	2.82	38.0	.....	"	2.47	8.5	3.68	224.0	3.10	77	3.34	23.0
9.....	2.79	35.0	.....	"	2.45	7.5	3.59	191.0	3.10	77	3.34	23.0
10.....	2.77	33.0	.....	"	2.43	6.7	3.60	194.0	3.11	79	3.29	24.0
11.....	2.74	30.0	.....	"	2.42	6.3	3.55	177.0	3.12	80	3.29	24.0
12.....	2.71	27.0	.....	"	2.50	10.0	3.44	145.0	3.12	80	3.30	25.0
13.....	2.88	41.0 ^f	.....	"	3.34	122.0	3.33	120.0	3.12	89	3.30	25.0
14.....	3.16	74.0	.....	"	3.14	85.0	3.31	116.0	3.17	89	3.25	27.0
15.....	2.77	25.0	.....	"	2.84	41.0	3.27	108.0	3.14 ^g	83	3.27	21.0
16.....	2.72	21.0	.....	"	2.73	29.0	3.29	112.0	3.04	68	3.27	21.0
17.....	2.65	15.6	1.96	"	2.71	27.0	3.38	131.0	3.85	63	3.31	20.0
18.....	2.61	13.5	2.70	26.0	2.71	27.0	3.59	191.0	3.05	60	3.30	17.0
19.....	2.59	12.1	2.36	3.9	2.65	21.0	4.13	449.0	3.15	56	3.28	15.0
20.....	2.58	12.1	2.24	0.9	2.63	19.4	4.05	404.0	3.14	52	3.27	15.0
21.....	2.57	11.4	2.18	0.4	2.64	20.0	3.97	360.0	3.10	46	3.27	17.0
22.....	2.56	11.4	2.09	Nil	2.63	19.4	3.88	315.0	3.15	39	3.25	19.0
23.....	2.54	10.0	2.10	"	2.64	20.0	3.79	272.0	3.13	37	3.25	17.0
24.....	2.52	9.5	2.87	44.0	2.64	20.0	3.68	224.0	3.10	36	3.25	14.0
25.....	2.49	8.0	2.68	24.0	2.62	18.6	3.60	194.0	3.41	37	3.24	10.0
26.....	2.45	6.7	2.69	25.0	2.62	18.6	3.51	164.0	3.50	40	3.29	9.0
27.....	2.35	3.2 ^f	2.69	25.0	2.59	16.3	3.43	143.0	3.47	45	3.31	10.0
28.....	2.32	2.6	2.67	23.0	2.58	15.6	3.37	128.0	3.43	45	3.26	11.0
29.....	2.30	2.0	2.64	20.0	2.56	14.2	3.32	118.0	3.39	44	3.29	10.0
30.....	2.27	1.4	2.60	17.0	2.53	12.1	3.28	110.0	3.10	40	3.30	11.0
31.....	2.24	0.9	2.59	16.3	.....	.....	3.25	104.0	.....	.....	3.30	11.0

^f to ^f Shifting conditions.^g Automatic gauge to Nov. 16; staff gauge after Nov. 16.

MONTHLY DISCHARGE of Milk River at Spencer's Lower Ranch, for 1914.

(Drainage area 2,514 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (21-31).....	566	78.0	340.0	0.135	0.055	7,416
April.....	1,065	156.0	501.0	0.199	0.222	28,812
May.....	254	98.0	158.0	0.063	0.073	9,715
June.....	300	55.0	103.0	0.041	0.046	6,129
July.....	74	0.9	26.0	0.010	0.012	1,590
August.....	44	0.0	7.3	0.003	0.003	449
September.....	122	6.3	23.0	0.009	0.010	1,369
October.....	449	10.7	168.0	0.067	0.077	10,330
November.....	98	36.0	65.0	0.026	0.029	3,868
December.....	36	9.0	20.0	0.008	0.009	1,230
The period.....					0.536	71,917

STUDY OF CONDITIONS OF RUN-OFF IN WATERSHED OF MILK RIVER FROM ITS HEADWATERS TO ITS EASTERN CROSSING FROM CANADA.
 Sec. 3, Tp. 1, Rge. 5, W. 4th Mer.

STATION.	AREA OF WATERSHED IN SQUARE MILES.						RUN-OFF IN AC. FT.		RUN-OFF PER SQ. MILE IN AC. FT.
	Additional to last Station.			Total for Station.			Additional to last Station.	Total for Station.	
	Canada.	U.S.A.	Total.	Canada.	U.S.A.	Total.			
For Period Aug. 1 to Oct. 31, 1914.									
Peters' Ranch (N.Br.), NE. 11-1-23-4				10	91	101		4,208	41.66
Mackie's Ranch (S.Br.) NW. 31-1-18-4				90	414	504		5,615	11.14
Milk River.....NE. 21-2-10-4	477	22	499	577	527	1,104	+	1,374a	10.14
Writing-on-Stone.....SW. 35-1-13-4	340	102	442	917	629	1,546	—	1,386	0.00
Pendant d'Oreille.....SW. 21-2-8-4	468	155	623	1,385	784	2,169	+	1,771a	6.34
Spencer's Lower Ranch.....SE. 3-1-5-4	242	103	345	1,627	887	2,514	+	566a	5.35
								12,148	4.83

^a Heavy fall of snow and rain in the month of October resulted in an abnormal run-off and increase of discharge instead of the usual loss between stations during this period.

SESSIONAL PAPER No. 25c

DEER CREEK CATTLE COMPANY EAST DITCH FROM DEER CREEK.

Location.—On the SW. $\frac{1}{4}$ Sec. 36, Tp. 1, Rge. 12, W. 4th Mer.

Records available.—April 1, 1912, to November 23, 1912. Discharge measurements only during 1914.

Gauge.—Vertical staff; elevation of zero maintained at 93.49 feet since establishment.

Bench-mark.—Post on left bank; assumed elevation, 100.00 feet.

Discharge measurements.—Made by wading or with a weir.

Observer.—None obtainable in 1914.

Remarks.—The Deer Creek Cattle Company diverts all the water from Deer Creek through their two ditches, except in flood stages.

DISCHARGE MEASUREMENTS of Deer Creek Cattle Company East Ditch from Deer Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Oct. 17	J. E. Degnan	6.8	4.85	1.03	2.40	5.0
Oct. 21	do	6.0	3.40	1.17	2.35	4.9

DEER CREEK CATTLE COMPANY WEST DITCH FROM DEER CREEK.

Location.—On the SW. $\frac{1}{4}$ Sec. 36, Tp. 1, Rge. 12, W. 4th Mer.

Records available.—Discharge measurements during 1914.

Gauge.—Vertical staff; elevation, 100.50 feet.

Bench-mark.—Bench-mark at east ditch station.

Discharge measurements.—By wading or with a weir.

Observer.—None obtainable in 1914.

DISCHARGE MEASUREMENTS of Deer Creek Cattle Company West Ditch from Deer Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 30	J. E. Degnan				3.23	0.118
June 20	do				3.30	0.118

NOTE.—The above are weir measurements

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Milk River drainage basin, in 1914.

(Deer Creek See page.)

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
April 30	J. E. Degnan	Deer Creek	SW. 15-1-12-4				0.47
June 1	do	do	do				0.08
June 2	do	do	do				0.12
June 20	do	do	do				0.61
June 21	do	do	do				1.19
Aug. 23	F. R. Steinberger	do	do				Nil.
Sept. 4	do	do	do				Nil.
Sept. 17	J. E. Degnan	do	SE. 5-1-12-4				0.38
Sept. 17	do	do	SW. 15-1-12-4				0.03
Oct. 1	do	do	SE. 5-1-12-4				0.39
Oct. 1	do	do	NW. 4-1-12-4				0.34
Oct. 1	do	do	NE. 9-1-12-4				0.16
Oct. 1	do	do	SW. 15-1-12-4	<i>a</i>			0.17
Oct. 1	do	do	do	<i>b</i>			0.05
Oct. 1	do	do	NW. 15-1-12-4				Nil.
Oct. 17	do	do	SW. 36-1-12-4	9.8	16.5	1.36	22.3

a Measured at south line.

b Measured at north line.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Milk River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
May 30	J. E. Degnan	Bear Gulch Creek	Sec. 19-2-9-4				Nil.
June 10	do	do	do				"
June 18	do	do	do				"
July 4	do	do	do				"
July 25	do	do	do				"
Sept. 19	do	do	do				"
Sept. 29	do	do	do				"
Oct. 17	do	do	do	10.5	5.37	2.00	10.8
Oct. 21	do	do	do	5.5	2.90	1.31	3.8
April 13	H. W. Rowley	Dead Horse Coulee	Sec. 4-2-11-4				Nil.
April 28	J. E. Degnan	do	do				"
May 30	do	do	do				"
June 10	do	do	do				"
June 18	do	do	do				"
July 4	do	do	do				"
July 25	do	do	do				"
Sept. 19	do	do	do				"
Sept. 29	do	do	do				"
Oct. 17	do	do	do	7.0	4.90	1.40	6.80
Oct. 21	do	do	do	3.3	0.90	0.88	0.79
April 13	H. W. Rowley	Halfbreed Creek	SW. 28-2-10-4	8.0	5.33	0.76	4.00
April 28	J. E. Degnan	do	do	7.0	2.70	0.69	1.71
May 30	do	do	do				Nil.
June 10	do	do	do				"
June 18	do	do	do	8.0	6.50	0.81	5.30
July 4	do	do	do				Nil.
July 25	do	do	do				"
Sept. 19	do	do	do				"
Sept. 29	do	do	do				"
Oct. 17	do	do	do	29.5	18.9	1.92	36.0
Oct. 21	do	do	do	25.0	13.0	0.85	11.0
June 26	do	Mackie Creek	SW. 19-2-18-4		12' Weir		0.10
Sept. 11	F. R. Steinberger	do	do				Nil.
Oct. 14	J. E. Degnan	do	do	4.5	0.67	0.52	0.35
Oct. 26	do	do	do	3.0	0.50	0.64	0.32
Aug. 18	do	Milk River	NW. 20-2-8-4	17.0	4.25	0.62	2.60
April 13	H. W. Rowley	Miners Coulee	SW. 10-2-11-4	5.0	1.90	0.74	1.41
April 28	J. E. Degnan	do	do		15' Weir		0.07
May 30	do	do	do				Nil.
June 10	do	do	do				"
June 18	do	do	do				"
July 4	do	do	do				"
July 25	do	do	do				"
Sept. 19	do	do	do				"
Sept. 29	do	do	do				"
Oct. 17	do	do	do	18.0	16.20	1.64	26.60
Oct. 21	do	do	do	11.5	6.05	1.10	6.64
May 1	do	do	do	3.0	0.78	0.45	0.35
June 9	do	Police Creek	SW. 35-1-13-4				Nil.
Sept. 16	do	do	do				"
Oct. 2	do	do	do				"
Oct. 16	do	do	do	7.5	8.35	0.96	8.03
April 11	do	Red Creek	Sec. 18-1-15-4				Nil.
July 28	do	do	do				"
July 21	do	do	do				"
Sept. 30	do	Spring Creek	SE. 3-1-12-4		12' Weir		0.11
Sept. 17	do	do	do		12' Weir		0.13
Oct. 22	do	do	NE. 11-1-12-4	1.4	0.69	0.41	0.28

PAKOWKI LAKE DRAINAGE BASIN.

General Description.

The drainage into Pakowki Lake comes from three different directions: from the west by way of Etzikom Coulee, from the southeast through Canal and Ketchum Creeks, and from the northeast through Manyberries and Irrigation Creeks. The streams within this drainage basin are very similar in their general characteristics, all having narrow, deep and well-defined valleys, with spare growth of brush along the bottoms, and draining a sandy and very unproductive soil. The drainage consists almost entirely of the spring run-off, the soil being so devoid of moisture as to take care of any ordinary rainfall, except during periods of exceptional heavy rains. Most of the land drained by Canal Creek is gumbo; at its source the land is broken and unproductive, locally known as "bad lands," and any ordinary rain will start the creek to flow.

Two gauging stations have been established in this drainage basin, one on Manyberries Creek at Hooper and Huckvale's ranch. Several measurements of the spring run-off were made in 1914. On April 16, 1914, a station was established on Etzikom Coulee. Owing to the very dry season very little data were collected.

Messrs. Hooper and Huckvale have constructed efficient irrigation works, and divert water from Manyberries Creek to irrigate 2,760 acres of hay meadow.

ETZIKOM COULEE NEAR STIRLING.

Location.—On road allowance between SW. $\frac{1}{4}$ Sec. 3 and SE. $\frac{1}{4}$ Sec. 4, Tp. 7, Rge. 19, W. 4th Mer., at the highway bridge one mile north and east of Stirling.

Records available.—May 1, 1914, to October 31, 1914.

Drainage area.—The run-off of this coulee during 1914 was practically all overflow of the Alberta Railway and Irrigation Company's irrigation ditch, with the exception of the period from October 4 to 31, when there was some run-off from melting snow.

Gauge.—Vertical staff, fastened to bridge pile on the upstream side; elevation of zero of gauge maintained at 93.43 feet.

Bench-mark.—The head of a spike driven into the northeast corner of the bridge abutment; assumed elevation, 100.00 feet.

Channel.—Composed of clay, and liable to be affected by the growth of weeds in the bed.

Discharge measurements.—Made from the bridge, by wading or with a weir.

Observer.—F. Adler.

DISCHARGE MEASUREMENTS of Etzikom Coulee near Stirling, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 16.....	J. E. Degnan.....				1.50	0.03b
May 4.....	do.....					Nil.
May 22.....	do.....	2.5	0.72	0.40	1.47	0.29a
June 4.....	do.....					Nil.
July 16.....	do.....	6.0	1.60	0.49	1.93	0.79a
Oct. 12.....	do.....				1.70	0.25b

a Measured below bridge.

b Discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Etzikom Coulee near Stirling, for 1914.

DAY.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	2.90	5.90	2.00	1.00
2.....	"	"	"	"	"	"	"	"	2.87	5.70	1.60	0.15
3.....	"	"	"	"	"	"	"	"	2.85	5.50	1.80	0.55
4.....	"	"	"	"	"	"	"	"	2.66	4.20	1.83	0.61
5.....	"	"	"	"	"	"	"	"	2.50	3.20	1.97	0.91
6.....	2.98	6.50	"	"	"	"	"	"	2.53	3.50	2.00	1.00
7.....	2.05	1.15	2.25	1.90	"	"	"	"	2.55	3.50	2.12	1.38
8.....	1.65	0.25	1.82	0.59	"	"	"	"	2.56	3.60	2.00	1.00
9.....	2.65	4.10	1.55	0.10	1.76	0.47	"	"	2.62a	3.90	1.93	0.81
10.....	2.31	2.10	2.00	1.00	2.20	1.70	2.85	5.50	2.67	4.20	1.80	0.55
11.....	1.96	0.88	1.76	0.47	1.90	0.75	1.76	0.47	2.70	4.40	1.72	0.39
12.....	1.70	0.35	Dry.	Nil.	1.78	0.51	1.60	0.15	2.72	4.60	1.70	0.35
13.....	1.68	0.31	"	"	1.60	0.15	Dry.	Nil.	2.68	4.30	1.74	0.43
14.....	1.58	0.13	"	"	Dry.	Nil.	"	"	2.39	2.50	1.78	0.51
15.....	1.60	0.15	"	"	"	"	"	"	2.70	4.40	1.80	0.55
16.....	1.66	0.27	"	"	2.50	3.20	1.85	0.65	2.25	1.90	1.71	0.37
17.....	1.72	0.39	"	"	2.00	1.00	1.90	0.75	2.28	2.00	1.68	0.31
18.....	1.70	0.35	"	"	1.90	0.75	2.00	1.00	2.30	2.10	1.62	0.39
19.....	1.68	0.31	"	"	1.62	0.19	2.30	2.10	2.30	2.10	1.60	0.15
20.....	1.66	0.27	"	"	1.51	0.06	2.70	4.40	2.32	2.20	1.58	0.13
21.....	1.53	0.08	"	"	Dry.	Nil.	3.00	6.70	2.20	1.70	1.52	0.07
22.....	1.50	0.05	"	"	"	"	3.25	8.90	2.10	1.30	1.50	0.05
23.....	Dry.	Nil.	"	"	"	"	3.50	11.50	2.50	3.20	Dry.	Nil.
24.....	"	"	"	"	"	"	3.70	14.10	1.70	0.35	"	"
25.....	"	"	"	"	"	"	3.40	10.40	1.62	0.19	"	"
26.....	"	"	"	"	"	"	3.36	10.00	Dry.	Nil.	"	"
27.....	"	"	2.20	1.70	"	"	2.91	6.00	"	"	"	"
28.....	"	"	1.57	0.12	"	"	2.00	1.00	2.21	1.74	"	"
29.....	"	"	1.51	0.06	"	"	1.98	0.94	2.90	5.90	"	"
30.....	"	"	Dry.	Nil.	"	"	2.85	5.50	3.26	9.20	"	"
31.....	"	"	"	"	"	"	2.87	5.70	"	"	"	"

a Gauge height interpolated.

MONTHLY DISCHARGE of Etzikom Coulee near Stirling, in 1914.

(Drainage area 203 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May.....	6.50	0.00	0.57	.....	.....	35
June.....	1.90	0.00	0.20	.....	.....	12
July.....	3.20	0.00	0.28	.....	.....	17
August.....	14.10	0.00	3.10	.....	.....	191
September.....	9.20	0.00	3.20	.....	.....	190
October.....	1.38	0.00	0.37	.....	.....	23

NOTE.—This water is overflow of the A. R. & I. irrigation ditch near Stirling.

MANYBERRIES CREEK AT HOOPER AND HUCKVALE'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 27, Tp. 4, Rge. 6, W. 4th Mer.*Records available.*—April 1, 1911, to October 31, 1914.*Drainage area.*—142 square miles.*Gauge.*—Vertical staff; maintained at the original elevation of 87.00 feet.*Bench-mark.*—Permanent iron bench-mark; assumed elevation, 100.00 feet.*Channel.*—The stream flows in one channel except in very high stages; bed consists of sand, clay and gravel.

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Discharge measurements.—At low stages, made by wading; at high stages, a portable cable and cable car is used.

Diversions.—Hooper and Huckvale's north ditch diverts water about one-half mile above this station, and the south ditch about one-half mile below.

Observer.—Sidney Hooper.

Remarks.—Hooper and Huckvale's north ditch is included in the run-off at this station.

DISCHARGE MEASUREMENTS of Manyberries Creek at Hooper and Huckvale's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 31.....	H. W. Rowley.....	15.0	18.70	0.78	3.60	14.50 ^a
Mar. 31.....	do.....				5.29	93.00 ^b
April 8.....	do.....	12.0	6.20	1.70	2.48	10.50
April 9.....	do.....	6.0	1.50	0.70	1.96	1.05
April 9.....	do.....	8.0	3.60	1.92	2.30	6.90
April 19.....	H. R. Carscallen.....	3.2	0.63	0.45	1.74	0.30
April 27.....	J. E. Degnan.....				1.66	0.95
June 12.....	do.....					Nil.
July 10.....	do.....					"
Aug. 14.....	do.....					"
Aug. 28.....	F. R. Steinberger.....					"
Sept. 24.....	J. E. Degnan.....					"

^a Measurement affected by ice.

^b Measured one mile and one-half upstream.

DAILY GAUGE HEIGHT AND DISCHARGE of Manyberries Creek at Hooper and Huckvale's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			5.00	84.00	Dry.	Nil.	Dry.	Nil.
2.....			4.74	76.00	"	"	"	"
3.....			3.96	51.00	"	"	"	"
4.....			4.30	62.00	"	"	"	"
5.....			4.96	83.00	"	"	"	"
6.....	2.92	22.00	4.74	76.00	"	"	3.81	47.0
7.....	2.27	6.40	3.22	30.00	"	"	3.75	45.0
8.....	2.30	6.90	2.28	6.50	"	"	1.90	1.4
9.....	2.84	19.50	2.17	4.70	"	"	Dry.	Nil.
10.....	3.09	26.00	2.02	2.70	"	"	"	"
11.....	2.44	9.70	2.06	3.20	"	"	"	"
12.....	2.58	12.90	1.92	1.58	"	"	"	"
13.....	4.08	55.00	2.69	15.60	"	"	"	"
14.....	5.00	84.00	3.04	25.00	"	"	"	"
15.....	3.49	38.00	3.04	25.00	"	"	"	"
16.....	3.25	31.00	2.46	10.10	"	"	"	"
17.....	3.05	25.00	2.19	5.00	"	"	"	"
18.....	2.92	22.00	2.11	3.80	"	"	"	"
19.....	2.14	4.30	1.76	0.46	"	"	"	"
20.....	2.13	4.10	1.62	Nil.	"	"	"	"
21.....	2.04	3.00	1.54	"	"	"	"	"
22.....	1.89	1.32	1.54	"	"	"	"	"
23.....	1.82	0.82	Dry.	"	"	"	"	"
24.....	1.79	0.64	"	"	"	"	"	"
25.....	Dry.	Nil.	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	1.66	0.04	"	"	2.01	2.6
28.....	"	"	Dry.	Nil.	"	"	Dry.	Nil.
29.....	"	"	"	"	"	"	"	"
30.....	1.93	1.67	"	"	"	"	"	"
31.....	4.46	67.00			"	"		

DAILY GAUGE HEIGHT AND DISCHARGE of Manyberries Creek at Hooper and Huckvale's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	"	"
5.....	"	"	"	"	"	"	"	"
6.....	"	"	"	"	"	"	"	"
7.....	"	"	"	"	"	"	"	"
8.....	"	"	"	"	"	"	3.86	48.0
9.....	"	"	"	"	"	"	4.95	82.0
10.....	"	"	"	"	"	"	2.94	22.0
11.....	"	"	"	"	"	"	1.75	0.4
12.....	"	"	"	"	"	"	Dry.	Nil.
13.....	"	"	"	"	"	"	"	"
14.....	"	"	"	"	"	"	"	"
15.....	"	"	"	"	"	"	"	"
16.....	"	"	"	"	"	"	"	"
17.....	"	"	"	"	"	"	"	"
18.....	"	"	"	"	"	"	"	"
19.....	"	"	"	"	"	"	"	"
20.....	"	"	"	"	"	"	"	"
21.....	"	"	"	"	"	"	"	"
22.....	"	"	"	"	"	"	"	"
23.....	"	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Manyberries Creek at Hooper and Huckvale's Ranch, for 1914.

(Drainage area 142 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (6-31).....	114.0	0.62	28.00	0.197	0.190	1,444
April.....	87.0	0.00	23.00	0.162	0.181	1,369
May.....	64.0	0.00	4.70	0.033	0.040	280
June.....	8.6	0.00	0.43	0.003	0.004	26
July.....	12.1	0.00	0.58	0.004	0.004	34
August.....	113.0	0.00	8.50	0.060	0.070	523
September.....						
October.....						
The period.....					0.488	3,676

NOTE.—This table includes Hooper and Huckvale's north ditch to get the total flow of the creek.

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HOOPER AND HUCKVALE NORTH DITCH FROM MANYBERRIES CREEK.

Location.—On SW. $\frac{1}{4}$ Sec. 27, Tp. 4, Rge. 6, W. 4th Mer.

Records available.—May 2, 1912, to October 31, 1914.

Gauge.—Vertical staff; maintained at the original elevation of 93.35 feet.

Bench-mark.—On the northwest corner of the foundation of the ranch house; assumed elevation, 100.00 feet.

Channel.—One channel at all stages; the bed is composed of clay.

Discharge measurements.—At all stages, with a current-meter, by wading.

Observer.—Sidney Hooper.

Remarks.—1913 discharge taken from the 1914 discharge table.

DISCHARGE MEASUREMENTS of Hooper and Huckvale North Ditch from Manyberries Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 21.....	H. W. Rowley.....	9.0	10.20	0.68	2.24	7.00
April 6.....	do.....	9.5	12.80	0.92	2.45	11.80
April 6.....	do.....	10.0	15.70	1.22	2.68	19.10
April 6.....	do.....	11.4	18.80	1.49	2.95	28.00
April 6.....	do.....	11.5	19.80	1.55	2.99	31.00
April 6.....	do.....	7.0	2.10	0.57	1.78	1.19
April 27.....	J. E. Degnan.....	6.0	1.50	0.83	1.84	1.24
July 10.....	do.....					Nil.
Sept. 24.....	do.....					"

DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale North Ditch from Manyberries Creek, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.60	Nil.				
2.....			1.62	0.08				
3.....			1.62	0.08				
4.....			1.64	0.16				
5.....			2.04	3.80				
6.....	2.90c	27.00	2.42	11.00			2.46b	12.1
7.....	2.55	14.80	2.46	12.10			2.69	19.5
8.....	2.36	9.50	2.38	10.00			2.27	7.5
9.....	2.47	12.40	2.30	8.20			1.98	3.0
10.....	2.14	5.20	2.32	8.60			1.88	1.9
11.....	2.70	19.80	2.35	9.30				
12.....	2.78	23.00	2.34	9.10			1.60c	Nil.
13.....	2.89	26.00	2.08	4.30				
14.....	2.98	30.00	2.12	4.90				
15.....	2.76	22.00	2.05	3.90				
16.....	2.37	9.80	2.14	5.20				
17.....	2.36	9.50	2.28	7.80				
18.....	2.34	9.10	2.22	6.60				
19.....	2.52	13.80	2.15	5.30				
20.....	2.44	11.50	2.08	4.30				
21.....	2.04	3.80	2.08	4.30				
22.....	2.25	7.10	2.05	3.90				
23.....	2.10	4.60	1.98a	3.00				
24.....	2.18	5.80	1.90	2.10				
25.....	2.25	7.10	1.85	1.60				
26.....	1.87	1.80	1.83	1.44				
27.....	1.86	1.70	1.84	1.52				
28.....	1.80	1.20	1.60c	Nil.				
29.....	1.72	0.62						
30.....	1.78	1.04						
31.....	1.60	Nil.						

a Gauge height interpolated.

b Headgate open.

c Headgate closed.

DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale North Ditch from
Manyberries Creek, for 1914.—*Concluded.*

DAY.	August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....						
2.....						
3.....						
4.....						
5.....						
6.....						
7.....						
8.....					2.80 ^b	23.00
9.....						31.00 ^a
10.....						24.00 ^a
11.....						17.00 ^a
12.....						10.00 ^a
13.....					1.98	3.00
14.....			2.46 ^b	12.10	1.86	1.70
15.....			2.09	4.50	1.76	0.88
16.....			1.74	0.74	1.61	0.04
17.....			1.56 ^c	Nil.	1.59 ^c	Nil.
18.....						
19.....						
20.....						
21.....						
22.....						
23.....						
24.....						
25.....						
26.....						
27.....	2.32 ^b	8.6				
28.....	2.10 ^c	4.6				
29.....						
30.....						
31.....						

^a Discharge estimated.

^b Headgate open.

^c Headgate closed.

MONTHLY DISCHARGE of Hooper and Huckvale North Ditch from Manyberries Creek, for 1914

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
March (6-31).....	30.0	0.0	10.70	552
April.....	12.1	0.0	4.40	262
May.....				Nil.
June.....	19.5	0.0	1.47	87
July.....				Nil.
August.....	8.6	0.0	0.43	26
September.....	12.1	0.0	0.58	34
October.....	31.0	0.0	3.60	221
The period.....				1,182

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DAILY GAUGE HEIGHT AND DISCHARGE OF HOOPER AND HUCKVALE NORTH DITCH
from Manyberries Creek, for 1913.

DAY.	March.		April.		May.	
	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.	Gauge Height.	Dis- charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.			3.76	58.0	1.96	2.70
2.			3.36	41.0	1.95	2.60
3.			3.23	39.0	1.98	3.00
4.			3.30	41.0	2.00	3.20
5.			3.28	41.0	1.95	2.60
6.			3.64	54.0	1.95	2.60
7.	2.48 ^a	12.60	3.42	46.0	1.95	2.60
8.	2.94	28.00	3.33	42.0	1.94	2.50
9.	3.60	52.00	3.26	40.0	1.88	1.90
10.	3.24	39.00	3.17	37.0	1.87	1.80
11.	3.04	32.00	3.09	34.0	1.83	1.44
12.	2.84	25.00	3.20	38.0	1.78	1.04
13.	2.58	15.70	3.21	38.0	1.75	0.80
14.	2.78	23.00	3.08	33.0	2.62	17.10
15.	2.66	18.40	2.88	26.0	2.40	10.50
16.	2.10	4.60	2.87	26.0	2.42	11.00
17.	1.98	3.00	2.84	25.0	2.20	6.20
18.	1.74	0.70	2.70	19.8	1.89	2.00
19.	1.60	0.00	2.52	13.8	1.86	1.70
20.	2.20 ^b	6.20	2.61	16.7	1.83	1.44
21.			2.52	13.8	1.76	0.88
22.			2.41	10.8	1.75	0.80
23.			2.32	8.6	1.74	0.74
24.			2.24	6.9	1.73	0.68
25.			2.21	6.4	1.69	0.44
26.			2.10	4.6	1.64	0.16
27.			1.95	2.6	1.65	0.20
28.			1.92	2.3	1.65	0.20
29.	2.23 ^a	6.70	1.89	2.0	1.64	0.16
30.	3.62	53.00	1.95	2.6	1.62	0.08
31.	3.02	64.00			1.54 ^b	0.00

a Headgate opened.

b Headgate closed.

MONTHLY DISCHARGE OF HOOPER AND HUCKVALE NORTH DITCH FROM MANYBERRIES CREEK,
for 1913.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF. Total in Acre-feet.
	Maximum.	Minimum.	Mean.	
March.	64.0	0.0	12.40	752
April.	58.0	2.0	26.00	1,547
May.	17.1	0.0	2.70	166
The period				2,475

HOOPER AND HUCKVALE SOUTH DITCH FROM MANYBERRIES CREEK.

Location.—On NE. $\frac{1}{4}$ Sec. 22, Tp. 4, Rge. 6, W. 4th Mer.*Records available.*—March 31, 1914, to October 31, 1914.*Gauge.*—Vertical staff; maintained at the original elevation of 93.07 feet.*Bench-mark.*—The head of a spike driven in the top of a 4" x 4" post at the dam, about 70 feet north of gauge rod; assumed elevation, 100.00 feet.*Channel.*—The channel is narrow and the banks high; the bed is composed of clay, with a silt and sand wash from the creek.*Discharge measurements.*—Measurements are made with a current-meter, by wading.*Diversions.*—The water through this ditch is diverted from Manyberries Creek.*Observer.*—Sidney Hooper.

DISCHARGE MEASUREMENTS of Hooper and Huckvale South Ditch from Manyberries Creek,
in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 4.....	H. W. Rowley.....	9.0	14.90	1.01	2.73	15.10
April 7.....	do.....	9.0	11.20	0.83	2.32	9.30
April 9.....	do.....	2.5	0.70	0.70	1.12	0.49
April 9.....	do.....	3.5	1.45	0.83	1.30	1.21
Sept. 24.....	J. E. Degnan.....					Nil.

DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale South Ditch
from Manyberries Creek, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.00 ^a	19.5				
2.....			3.60 ^a	30.0				
3.....			3.60 ^a	30.0				
4.....			2.73	15.2				
5.....			2.59 ^b	13.1				
6.....			2.45 ^b	11.1				
7.....			2.32	9.4			2.87 ^c	17.30
8.....			1.82 ^b	4.4			1.74	3.80
9.....			1.30 ^d	1.2			1.04 ^d	0.28
10.....								Nil.
11.....								
12.....								
13.....								
14.....								
15.....								
16.....								
17.....								
18.....								
19.....								
20.....								
21.....								
22.....								
23.....								
24.....								
25.....								
26.....								
27.....							1.28 ^{c,d}	1.12
28.....								
29.....								
30.....								
31.....			2.00 ^a	5.9 ^c				

^a Gauge heights obtained from marks on bank.

^b Gauge height interpolated.

^c Headgate open.

^d Headgate closed.

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DAILY GAUGE HEIGHT AND DISCHARGE of Hooper and Huckvale South Ditch
from Manyberries Creek, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....								
2.....								
3.....								
4.....								
5.....								
6.....								
7.....								
8.....							2.46 ^b	11.2
9.....							3.05	20.0
10.....								12.0 ^a
11.....								20.0 ^a
12.....								
13.....								
14.....								
15.....								
16.....								
17.....								
18.....								
19.....								
20.....								
21.....								
22.....								
23.....								
24.....								
25.....								
26.....								
27.....								
28.....								
29.....								
30.....								
31.....								

^a Discharge estimated.^c Headgate opened.^c Headgate closed.MONTHLY DISCHARGE of Hooper and Huckvale South Ditch from Manyberries Creek
for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF. Total in Acre-feet.
	Maximum.	Minimum.	Mean.	
March (31).....	5.9	5.9	5.90	12
April.....	30.0	0.0	4.50	268
May.....				Nil.
June.....	17.3	0.0	0.77	46
July.....				Nil.
August.....				"
September.....				
October.....	20.0	0.0	1.46	90
The period.....				416

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Pakowki Lake drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Mar. 21.....	H. W. Rowley.	Canal Creek.....	SW. $\frac{1}{4}$ 6-4-6-4.....	2.6	5.98	0.69	4.10
Mar. 28.....	do	do	do	.....	.....	.....	Nil.
April 3.....	do	do	do	.....	8.5	8.63	0.54
April 11.....	do	do	do	.....	.....	.....	Nil.
April 27.....	J. E. Degnan	do	do	.....	.....	.....	"
June 15.....	do	do	Sec. 28-3-6-1.....	6.6	3.30	0.81	2.70
July 8.....	do	do	do	.....	.....	.....	Nil.
Aug. 14.....	do	do	do	.....	.....	.....	"
Sept. 24.....	do	do	do	.....	.....	.....	"
April 2.....	H. W. Rowley.	Irrigation Creek.....	SW. 36-5-7-4.....	12.5	7.80	1.12	8.70
April 8.....	do	do	do	3.8	1.25	0.78	0.98
Mar. 21.....	do	Ketchum Creek.....	SW. 14-4-6-4.....	.....	.....	.....	2.00 ^a
Mar. 28.....	do	do	do	.....	.....	.....	Nil.
Mar. 31.....	do	do	SE. 15-4-6-4.....	.....	.....	.....	2.67
April 3.....	do	do	SW. 36-4-7-4.....	15.0	11.6	0.97	11.20
April 11.....	do	do	SE. 16-4-6-4.....	.....	.....	.....	Nil.
April 7.....	do	do	do	15"	Weir.	.....	0.25
April 27.....	J. E. Degnan	do	do	.....	.....	.....	Nil.
June 15.....	do	do	do	.....	.....	.....	"
July 8.....	do	do	do	.....	.....	.....	"
Aug. 14.....	do	do	do	.....	.....	.....	"
Sept. 24.....	do	do	do	.....	.....	.....	"

^a Estimated.

SAGE CREEK DRAINAGE BASIN.

General Description.

Sage Creek is a small and unimportant stream, which rises in Township 5, Range 4, West of the 4th Meridian, and flows southerly, crossing the international boundary in Range 2.

The stream has no definite or permanent source of supply, and derives its discharge principally from the melting of snow, which accumulates in numerous coulees during the winter months. The period of flow, therefore, is in general confined to the spring months, while the melting snow is passing off. Very heavy rains sometimes cause a flow, but, the drainage area being absolutely devoid of tree growth, the run-off is very rapid.

After entering the United States, Sage Creek spreads out over a large, dry lake, which has no outlet. This lake is about ten miles long and averages one and a half miles in width, and lies close to the boundary. The lake is bounded on the south by a low range of hills, and at some time has held two or three feet of water at its deepest parts. Since 1908 there has been no water in the lake.

SAGE CREEK AT WILD HORSE POLICE DETACHMENT.

Location.—On the NE. $\frac{1}{4}$ Sec. 9, Tp. 1, Rge. 2, W. 4th Mer., near Wild Horse police detachment.

Records available.—Estimated discharge records are available for 1910-13.

Gauge.—Vertical staff; zero of gauge maintained at 93.36 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made by wading or with a weir.

Channel.—Composed of hard clay and well grassed over; practically permanent.

Observer.—No records of gauge heights were obtained in 1914, although there was a flow for about a week in the fall.

ESTIMATED MONTHLY DISCHARGE of Sage Creek near Wild Horse Police Detachment, for 1910.
(Drainage area 188 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (17-31).....	89.0	3.3	42.1	0.224	0.12	1,252
April.....	2.8	Nil. ^a
The period.....	0.12	1,252

^a No flow after April.

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ESTIMATED MONTHLY DISCHARGE of Sage Creek near Wild Horse Police Detachment, for 1911.

(Drainage area 188 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	10.5	Nil.	2.88	0.015	0.02	171
May.....						0
June.....						0
July.....	59	Nil.	9.10	0.049	0.06	560
August.....						0
September.....	172	Nil.	29.60	0.158	0.18	1,761
October.....	50	"	13.90	0.074	0.09	855
The period.....					0.35	3,347

ESTIMATED MONTHLY DISCHARGE of Sage Creek near Wild Horse Police Detachment, for 1912.

(Drainage area 188 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	170.0	6.5	67.20	0.357	0.40	3,999
May.....	11.5	Nil.	4.63	0.025	0.03	286
June.....	17.5	"	4.08	0.022	0.02	243 ^a
The period.....					0.45	4,528

^a No flow after June.

ESTIMATED MONTHLY DISCHARGE of Sage Creek near Wild Horse Police Detachment, for 1913.

(Drainage area 188 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	142.0	7.2	65.5	0.348	0.50	3,898
May.....	8.0	0.5	13.5	0.072	0.08	830 ^a
The period.....					0.47	4,728

^a No flow after May.

LODGE CREEK DRAINAGE BASIN.

General Description.

Lodge Creek, which rises in Township 7, Range 3, West of the 4th Meridian, flows in a southerly direction for about twelve miles, then turns southeastward, crosses the international boundary in Section 4, Township 1, Range 28, West of the 3rd Meridian, and eventually empties into Milk River at Chinook, Montana. Its principal tributary is Middle Creek, which joins it in Section 4, Township 2, Range 29, West of the 3rd Meridian.

Near its head the valley is very deep and narrow, but it broadens out considerably lower down, giving rise to large flats and meadows. The upper part of the drainage basin is cut up to a great extent by deep coulees, which drain into the creek. This part of the creek is thickly covered with brush along the banks, but lower down it is totally devoid of tree growth. The valley is rather unproductive, owing to the absence of moisture, but a few good hay meadows have been developed along its course through the storage of the flood waters, and their application to the soil by irrigation. As is the case with many of the streams in this locality, the flow in Lodge Creek is not continuous throughout the year, the creek being dry, with the exception of pools of standing water, during the greater part of the summer months. At flood stages the creek carries a considerable amount of water, and as a result its channel is wide and well defined throughout the whole length of its course.

Three stations have been established on the main stream—at Willow Creek police detachment, near the international boundary; at Hartt's ranch, near the head of the creek; and about midway between these last two at Hester's ranch, near the 4th Meridian. Descriptions of these stations are given below.

EAST BRANCH OF LODGE CREEK AT ENGLISH'S RANCH.

Location.—On the SE. $\frac{1}{4}$ Sec. 1, Tp. 7, Rge. 3, W. 4th Mer., at James English's ranch.

Records available.—October 7, 1911, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 95.38 feet during 1911; 94.43 feet during 1912; 95.35 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Not likely to shift except during floods.

Discharge measurements.—Made by wading, or with weir.

Winter flow.—Station discontinued during winter season.

Diversions.—Water is diverted for irrigation, about three miles above this station, by James English.

Observer.—Mrs. Annie English.

DISCHARGE MEASUREMENTS of East Branch of Lodge Creek at English's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 18.....	H. W. Rowley.....	<i>a</i>.....	.....	.....	1.05	0.81
June 15.....	do.....	<i>a</i>	0.98	0.16
July 6.....	do.....	Dry.	Nil.
July 24.....	do.....	"	"
Sept. 25.....	do.....	"	"
Oct. 20.....	do.....	<i>a</i>	1.12	1.26

a Weir measurement.

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DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Lodge Creek at English's Ranch,
for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.40	26.0	1.16	1.90	0.98	0.18
2.....	2.50	28.0	1.16	1.90	0.98	0.18
3.....	2.60	30.0	1.14	1.62	1.00	0.28
4.....	2.78	34.0	1.14	1.62	1.00	0.28
5.....	2.72	32.0	1.10	1.16	1.02	0.44
6.....	2.77	33.0	1.15	1.74	1.00	0.28
7.....	1.90	16.2	1.17	2.00	1.02	0.44
8.....	1.48	7.5	1.23	2.90	1.06	0.78
9.....	1.46	7.3	1.80	14.20	1.06	0.78
10.....	1.52	8.6	1.68	11.80	1.10	1.16
11.....	1.58	9.8	1.50	8.20	1.16	1.89
12.....	2.23	23.0	1.40	6.20	1.18	2.15
13.....	2.30	24.0	1.35	5.20	1.20	2.40
14.....	1.74	13.0	1.28	3.80	1.18	2.15
15.....	1.90	16.2	1.15	1.74	1.17	2.00
16.....	1.80	14.2	1.10	1.16	1.15	1.74
17.....	1.72	12.6	1.10	1.16	1.13	1.51
18.....	1.70	12.2	1.05	0.68	1.10	1.16
19.....	1.65	11.2	1.05	0.68	1.10	1.16
20.....	1.55	9.2	1.03	0.52	1.08	0.97
21.....	1.50	8.2	1.00	0.28	1.00	0.28
22.....	1.45	7.2	1.00	0.28	1.00	0.28
23.....	1.40	6.2	1.00	0.28	0.98	0.18
24.....	1.38	5.5	0.95	0.04	0.98	0.18
25.....	1.30	4.2	0.95	0.04	1.00	0.28
26.....	1.25	3.2	0.95	0.04	1.00	0.28
27.....	1.23	2.9	0.95	0.04	0.98	0.18
28.....	1.23	2.9	0.95	0.04	0.95	0.04
29.....	1.20	2.4	0.95	0.04	0.95	0.04
30.....	1.16	1.9	0.95	0.04	0.95	0.04
31.....			0.95	0.04		

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Lodge Creek at English's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.93	Nil	Dry	Nil	Dry	Nil	Dry	Nil
2.....	0.90	"	"	"	"	"	"	"
3.....	0.85	"	"	"	"	"	"	"
4.....	0.80	"	"	"	"	"	"	"
5.....	Dry.	"	"	"	"	"	"	"
6.....	"	"	"	"	"	"	"	"
7.....	"	"	"	"	"	"	"	"
8.....	"	"	"	"	"	"	"	"
9.....	"	"	"	"	"	"	"	"
10.....	"	"	"	"	"	"	"	"
11.....	"	"	"	"	"	"	"	"
12.....	"	"	"	"	"	"	"	"
13.....	"	"	"	"	"	"	"	"
14.....	"	"	"	"	"	"	1.75	13.20
15.....	"	"	"	"	"	"	1.75	13.20
16.....	"	"	"	"	"	"	1.73	12.80
17.....	"	"	"	"	"	"	1.70	12.20
18.....	"	"	"	"	"	"	1.65	11.20
19.....	"	"	"	"	"	"	1.60	10.20
20.....	"	"	"	"	"	"	1.50	8.20
21.....	"	"	"	"	"	"	1.40	6.20
22.....	"	"	"	"	"	"	1.30	4.20
23.....	"	"	"	"	"	"	1.20	2.40
24.....	"	"	"	"	"	"	1.10	1.16
25.....	"	"	"	"	"	"	1.00	0.28
26.....	"	"	"	"	"	"	0.90	Nil.
27.....	"	"	"	"	"	"	0.90	"
28.....	"	"	"	"	"	"	0.88	"
29.....	"	"	"	"	"	"	0.88	"
30.....	"	"	"	"	"	"	0.88	"
31.....	"	"	"	"	"	"	0.88	"

MONTHLY DISCHARGE of East Branch of Lodge Creek at English's Ranch, for 1914.

(Drainage area 16 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	34.00	1.90	13.80	0.860	0.960	821
May.....	14.20	0.04	2.30	0.144	0.170	141
June.....	2.40	0.04	0.79	0.049	0.060	47
July.....						Nil.
August.....						"
September.....						"
October.....	13.20	0.00	3.07	0.191	0.220	189
The period.....					1.410	1,198

ANDERSON DITCH FROM EAST BRANCH OF LODGE CREEK.

Location.—On the SW. $\frac{1}{4}$ Sec. 23, Tp. 6, Rge. 3, W. 4th Mer., at the intake of Robert Anderson's ditch near Thelma.

Records available.—For the irrigation seasons of 1912-14.

Gauge.—Vertical staff; zero of gauge maintained at an elevation of 98.63 feet during 1912; 98.64 feet during 1913-14.

Bench-mark.—Wooden stake; assumed elevation, 100.00 feet.

Discharge measurements.—Made by wading, or with a weir.

Observer.—Robt. Anderson.

Remarks.—No water was diverted for irrigation during 1914.

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LODGE CREEK AT HARTT'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 10, Tp. 6, Rge. 3, W. 4th Mer., at Ed. Hartt's ranch.

Records available.—July 22, 1909, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero maintained at 86.36 feet during 1911-12; 83.33 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Covered with a heavy growth of willow brush.

Discharge measurements.—Made by wading, or with a weir.

Winter flow.—Station discontinued during winter season.

Artificial control.—There are several small beaver dams near this station.

Diversions.—Water is diverted for irrigation above this station by Ed. Hartt and Anderson Brothers.

Observer.—Mrs. Clara B. Hartt.

DISCHARGE MEASUREMENTS of Lodge Creek at Hartt's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 16.....	H. R. Carscadden	10.7	39	1.08	5.04	42.00
May 18.....	H. W. Rowley	.....	.....	.....	1.66	0.98
June 16.....	do	.....	.....	.....	1.59	0.65
July 6.....	do	.....	.....	.....	Dry.	Nil.
July 30.....	do	.....	.....	.....	"	"
Aug. 23.....	do	.....	.....	.....	"	"
Sept. 23.....	do	.....	.....	.....	"	"
Oct. 21.....	do	.....	.....	.....	1.85	0.32

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Hartt's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.55	15.6	1.84 ^a	1.55	1.00	Nil.
2.....			6.70	93.0	1.84 ^a	1.55	1.10	"
3.....			6.20	77.0	1.84 ^a	1.55	1.50	0.32
4.....			6.88	100.0	1.84	1.55	1.65	0.84
5.....			7.95	140.0	2.20	3.10	1.66	0.88
6.....			7.28	115.0	2.15	2.80	2.30	3.70
7.....			5.10	45.0	2.30	3.70	1.95	1.98
8.....			5.15	46.0	2.46	4.70	1.95	1.98
9.....			4.85	38.0	3.85	19.80	1.90	1.78
10.....			4.88	39.0	3.83	19.40	2.30	3.70
11.....			4.66	34.0	3.00	9.40	2.25	3.40
12.....			5.39	56.0	2.15	5.00	1.60	0.66
13.....			5.75	63.0	2.15	2.80	2.15	2.80
14.....	6.75	95.00	5.70	61.0	2.05	2.38	1.75	1.21
15.....	7.80	134.00	5.45	58.0	1.90	1.78	1.59	0.62
16.....	5.55	62.00	5.10	45.0	1.85	1.59	1.55	0.48
17.....	4.72	35.00	5.18	47.0	1.75	1.21	1.50	0.32
18.....	3.70	17.60	4.80	37.0	1.70	1.02	1.50	0.32
19.....	3.00	9.40	3.98	22.0	1.55	0.48	1.50	0.32
20.....	3.00	9.40	3.27	12.3	1.55	0.48	1.40	0.08
21.....	3.00	9.40	3.13 ^a	10.7	1.55	0.48	Dry.	Nil.
22.....	3.00	9.40	3.00	9.4	1.55	0.48	"	"
23.....	3.00	9.40	3.15	11.0	1.55	0.48	"	"
24.....	3.00	9.40	3.25	12.1	1.53	0.42	"	"
25.....	3.00	9.40	2.90	8.4	1.53	0.42	"	"
26.....	3.00	9.40	2.50	5.00	1.50	0.32	"	"
27.....	3.00	9.40	2.40	4.30	1.21	Nil.	"	"
28.....	3.00	9.40	1.84	1.55	1.10	"	"	"
29.....	3.00	9.40	1.84	1.55	1.00	"	"	"
30.....	3.00	9.40	1.84	1.55	1.00	"	"	"
31.....	3.40	13.80			0.90	"		

^a Gauge heights interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Hartt's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	"	"
5.....	"	"	"	"	"	"	"	"
6.....	"	"	"	"	"	"	1.80	1.40
7.....	"	"	"	"	"	"	3.75	18.30
8.....	"	"	"	"	"	"	2.75	7.00
9.....	"	"	"	"	"	"	2.25	3.40
10.....	"	"	"	"	"	"	2.00	2.20
11.....	"	"	"	"	"	"	1.75	1.21
12.....	"	"	"	"	"	"	1.70	1.02
13.....	"	"	"	"	"	"	1.60	0.66
14.....	"	"	"	"	"	"	1.56	0.52
15.....	"	"	"	"	"	"	1.55	0.48
16.....	"	"	"	"	"	"	2.12	2.70
17.....	"	"	"	"	"	"	2.30	3.70
18.....	"	"	"	"	"	"	2.25	3.40
19.....	"	"	"	"	"	"	2.20	3.10
20.....	"	"	"	"	"	"	2.05	2.40
21.....	"	"	"	"	"	"	1.85	1.59
22.....	"	"	"	"	"	"	1.65	0.84
23.....	"	"	"	"	"	"	1.45	0.18
24.....	"	"	"	"	"	"	1.40	0.08
25.....	"	"	"	"	"	"	1.35	0.02
26.....	"	"	"	"	"	"	Dry.	Nil.
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Lodge Creek at Hartt's Ranch, for 1914.

(Drainage area 80 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (14-31).....	134.00	9.40	26.00	0.3250	0.220	932
April.....	140.00	1.55	40.00	0.5000	0.560	2,380
May.....	19.80	0.00	2.80	0.0350	0.040	172
June.....	3.70	0.00	0.83	0.0100	0.011	49
July.....						Nil.
August.....						"
September.....						"
October.....	18.30	0.00	1.74	0.0215	0.025	107
The period.....					0.860	3,640

SESSIONAL PAPER No. 25c

LODGE CREEK AT HESTER'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 25, Tp. 3, Rge. 1, W. 4th Mer., at Hester Brothers' ranch. This station was moved from the NE. $\frac{1}{4}$ Sec. 36, Tp. 3, Rge. 1, W. 4th Mer., on April 29, 1914.

Records available.—August 31, 1912, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero of gauge at original station (records from August 31, 1912, to April 28, 1914), 87.29 feet. At new station, from April 28, 1914, to October 31, 1914, elevation of zero of gauge 89.31 feet.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet. Located 6 $\frac{1}{2}$ feet west of the I.P. stake, and 387 feet southwest of Hester's house.

Channel.—Practically permanent.

Discharge measurements.—Made by wading, or with a weir.

Winter flow.—Station discontinued during winter season.

Artificial control.—There are many small beaver dams across the creek near this station, both above the station and below, but as the channel is narrow they do not store much water, and have very little effect upon the flow of the creek.

Diversions.—Geo. Legg and Jas. Mitchell use water for irrigation between this station and the station at Hartt's ranch.

Observer.—Miss Marcia Hester.

DISCHARGE MEASUREMENTS of Lodge Creek at Hester's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 29.....	H. W. Rowley.	22	9 2	.77	1.76	7.10
June 17.....	do	" a	"	"	1.51	2.40
July 15.....	do	"	"	"	1.20	Nil.
Aug. 26.....	do	"	"	"	Dry.	"
Sept. 26.....	do	"	"	"	"	"
Oct. 24.....	do	"	"	"	1.21	"

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Hester's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.80	106.0	1.66	4.80	1.09	Nil.
2.....			2.30	72.0	1.66	4.80	1.08	"
3.....			2.55	88.0	1.60	3.70	1.08	"
4.....			2.75	102.0	1.62	4.10	1.10	"
5.....			3.00	120.0	1.63	4.20	1.10	"
6.....			3.40	148.0	1.60	3.70	1.10	"
7.....			3.00	120.0	1.61	3.90	1.10	"
8.....			2.50	85.0	1.61	3.90	1.11	"
9.....			2.18	65.0	1.65	4.60	1.14	"
10.....			1.99	53.0	1.76	7.10	1.14	"
11.....			1.73	40.0	1.85	9.40	1.16	"
12.....			1.33	23.0	2.30	21.00	1.16	"
13.....			1.86	46.0	2.35	22.00	1.36	0.78
14.....			3.10	127.0	2.33	22.00	1.45	1.60
15.....			3.17	132.0	1.65	4.60	2.10	15.90
16.....	1.06a	14.5	3.11	128.0	1.63	4.20	1.97	12.50
17.....	1.06	14.5	2.99	119.0	1.50	2.20	1.47	1.84
18.....	2.07	58.0	1.96	52.0	1.49	2.10	1.35	0.70
19.....	2.04	56.0	1.77	42.0	1.45	1.60	1.27	0.18
20.....	1.97	52.0	1.60	34.0	1.35	0.70	1.25	0.10
21.....	1.28	21.0	1.49	29.0	1.32	0.46	1.19	Nil.
22.....	0.70	6.0	1.30	22.0	1.30	0.30	1.15	"
23.....	0.13	Nil.	1.30	22.0	1.30	0.30	1.10	"
24.....	0.12	"	1.25	20.0	1.28	0.22	1.10	"
25.....	0.11	"	1.20	18.5	1.26	0.14	1.10	"
26.....	0.11	"	0.90	10.2	1.25	0.10	1.10	"
27.....	0.10	"	0.75	7.0	1.21	0.02	1.10	"
28.....	0.10	"	0.706	6.0	1.16	Nil.	1.16	"
29.....	0.11	"	1.76	7.1	1.10	"	1.21	0.02
30.....	0.11	"	1.76	7.1	1.09	"	1.25	0.10
31.....	1.90	48.0			1.09	"		

a to b Gauge heights and discharge at upper station NE. 36-3-1-4.

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Hester's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.25	0.10	Dry	Nil	Dry	Nil	Dry	Nil
2.....	1.25	0.10	"	"	"	"	"	"
3.....	1.24	0.08	"	"	"	"	"	"
4.....	1.24	0.08	"	"	"	"	"	"
5.....	1.24	0.08	"	"	"	"	"	"
6.....	1.23	0.06	"	"	"	"	"	"
7.....	1.23	0.06	"	"	"	"	"	"
8.....	1.23	0.06	"	"	"	"	"	"
9.....	1.22	0.04	"	"	"	"	2.60	29.00
10.....	1.22	0.04	"	"	"	"	2.50	26.00
11.....	1.21	0.02	"	"	"	"	2.10	15.90
12.....	1.21	0.02	"	"	"	"	2.00	13.30
13.....	1.21	0.02	"	"	"	"	1.95	12.00
14.....	1.20	Nil	"	"	"	"	1.80	8.10
15.....	1.20	"	"	"	"	"	1.75	6.80
16.....	1.20	"	"	"	"	"	1.60	3.70
17.....	1.20	"	"	"	"	"	1.50	2.20
18.....	1.19	"	"	"	"	"	1.40	1.10
19.....	1.18	"	"	"	"	"	1.30	0.30
20.....	1.18	"	"	"	"	"	1.28	0.22
21.....	1.16	"	"	"	"	"	1.24	0.08
22.....	1.14	"	"	"	"	"	1.22	0.04
23.....	1.13	"	"	"	"	"	1.21	0.02
24.....	1.09	"	"	"	"	"	1.21	0.02
25.....	1.06	"	"	"	"	"	1.19	Nil
26.....	1.06	"	"	"	"	"	1.16	"
27.....	1.06	"	"	"	"	"	1.10	"
28.....	1.06	"	"	"	"	"	1.08	"
29.....	1.06	"	"	"	"	"	1.06	"
30.....	1.06	"	"	"	"	"	1.02	"
31.....	1.06	"	"	"	"	"	1.00	"

MONTHLY DISCHARGE of Lodge Creek at Hester's Ranch, for 1914.

(Drainage area 223 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (16-31).....	58.00	0.00	16.90	0.0760	0.0450	535
April.....	148.00	6.00	62.00	0.2780	0.3100	3,689
May.....	22.00	0.00	4.40	0.1970	0.0230	270
June.....	15.90	0.00	1.13	0.0050	0.0060	67
July.....	0.10	0.00	0.02	0.0001	0.0001	2
August.....						Nil
September.....						"
October.....	29.00	0.00	3.80	0.0170	0.0200	236
The period.....					0.4000	4,799

SESSIONAL PAPER No. 25c

MIDDLE CREEK AT MACKINNON'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 35, Tp. 5, Rge. 1, W. 4th Mer., at Angus MacKinnon's ranch.

Records available.—From June 21, 1910, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 91.49 feet during 1910-11; 91.57 feet during 1912; 91.47 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Practically permanent.

Winter flow.—Station discontinued during winter season.

Observer.—A. D. MacKinnon.

DISCHARGE MEASUREMENTS of Middle Creek at MacKinnon's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 23.....	H. R. Carscallen.....	4.90	1.17	0.71	2.14	0.83
April 28.....	H. W. Rowley.....	9.00	3.00	0.99	1.10	2.98
May 19.....	do.....	<i>a</i>	<i>a</i>	<i>a</i>	0.81	0.98
June 16.....	do.....	<i>a</i>	<i>a</i>	<i>a</i>	0.60	0.71
July 7.....	do.....	<i>a</i>	<i>a</i>	<i>a</i>	0.55	0.47
July 31.....	do.....	<i>a</i>	<i>a</i>	<i>a</i>	0.60	0.24
Aug. 26.....	do.....	<i>a</i>	<i>a</i>	<i>a</i>	0.54	0.19
Sept. 26.....	do.....	<i>a</i>	<i>a</i>	<i>a</i>	0.79	0.20
Oct. 22.....	do.....	<i>a</i>	<i>a</i>	<i>a</i>	0.58	0.35

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at MacKinnon's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			4.04	67.00	0.83	1.21	0.58	0.37
2.....			3.85	62.00	0.75	0.85	0.58	0.37
3.....			3.95	64.00	0.62	0.45	0.58	0.37
4.....			3.96	64.00	0.67	0.58	0.58	0.37
5.....			4.66	82.00	0.67	0.58	0.58	0.37
6.....			4.83	88.00	0.65	0.52	0.90	1.60
7.....			3.17	44.00	0.64	0.50	0.78	0.97
8.....			3.28	47.00	0.64	0.50	0.65	0.52
9.....			3.48	52.00	0.65	0.52	0.62	0.45
10.....			2.68	31.00	0.60	0.40	0.62	0.45
11.....			2.84	36.00	1.85	12.00	0.63	0.48
12.....			3.32 ^b	48.00	1.30	4.70	0.65	0.52
13.....			3.79	60.00	0.86	1.38	0.75	0.85
14.....			3.21	46.00	0.65	0.52	0.70	0.65
15.....			3.26	47.00	0.77	0.93	0.65	0.52
16.....	3.64	57	3.07 ^b	42.00	0.75	0.85	0.60	0.40
17.....	2.79	34	2.88	37.00	0.67	0.58	0.59	0.38
18.....	3.29	48	2.71	32.00	0.66	0.55	0.59	0.38
19.....	<i>a</i>		2.50	27.00	0.66	0.55	0.59	0.38
20.....			2.09	16.80	0.66	0.55	0.58	0.37
21.....			2.73	33.00	0.65	0.52	0.58	0.37
22.....			2.03	15.50	0.65	0.52	0.58	0.37
23.....			1.80	11.20	0.64	0.50	0.58	0.37
24.....			1.85	12.00	0.64	0.50	0.58	0.37
25.....			2.06	16.10	0.64	0.50	0.65	0.52
26.....			1.80	11.20	0.64	0.50	0.62	0.45
27.....			1.30	4.70	0.64	0.50	0.62	0.45
28.....			1.20	3.80	0.62	0.45	0.60	0.40
29.....			1.03	2.40	0.61	0.42	0.60	0.40
30.....			0.92	1.72	0.60	0.40	0.59	0.38
31.....	<i>a</i>				0.58	0.37		

a to *a* Frozen—no gauge height records.

b Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at MacKinnon's Ranch, for 1914.
—Concluded.

	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.57	0.36	0.54	0.31	0.50	0.25	0.50	0.25
2.....	0.56	0.34	0.54	0.31	0.50	0.25	0.50	0.25
3.....	0.55	0.33	0.54	0.31	0.50	0.25	0.53	0.48
4.....	0.55	0.33	0.54	0.31	0.50	0.25	0.59	0.38
5.....	0.55	0.33	0.54	0.31	0.51	0.26	0.65	0.52
6.....	0.55	0.33	0.54	0.31	0.51	0.26	0.65	0.52
7.....	0.58	0.37	0.54	0.31	0.51	0.26	0.65	0.52
8.....	0.58	0.37	0.54	0.31	0.51	0.26	1.30	4.70
9.....	0.58	0.37	0.62	0.45	0.51	0.26	0.66	0.55
10.....	0.75	0.85	0.62	0.45	0.51	0.26	0.65	0.52
11.....	0.75	0.85	0.62	0.45	0.51	0.26	0.63	0.48
12.....	0.75	0.85	0.61	0.42	0.51	0.26	0.61	0.42
13.....	0.75	0.85	0.61	0.42	0.51	0.26	0.60	0.40
14.....	0.75	0.85	0.61	0.42	0.52	0.28	0.59	0.38
15.....	0.75	0.85	0.61	0.42	0.52	0.28	0.59	0.38
16.....	0.75	0.85	0.61	0.42	0.52a	0.28	0.58	0.37
17.....	0.74	0.81	0.61	0.42	0.52	0.28	0.58	0.37
18.....	0.74	0.81	0.61	0.42	0.52	0.28	0.58	0.37
19.....	0.74	0.81	0.61	0.42	0.52	0.28	0.58	0.37
20.....	0.74	0.81	0.61	0.42	0.51	0.26	0.58	0.37
21.....	0.74	0.81	0.61	0.42	0.53	0.29	0.59	0.38
22.....	0.74	0.81	0.61	0.42	0.51	0.26	0.59	0.38
23.....	0.74	0.81	0.59	0.38	0.54	0.31	0.59	0.38
24.....	0.74	0.81	0.55	0.33	0.56	0.34	0.59	0.38
25.....	0.71	0.69	0.56	0.34	0.58	0.37	0.59	0.38
26.....	0.71	0.69	0.52	0.28	0.59a	0.38	0.59	0.38
27.....	0.71	0.69	0.51	0.26	0.55	0.33	0.59	0.38
28.....	0.71	0.69	0.50	0.25	0.50	0.25	0.59	0.38
29.....	0.71	0.69	0.50	0.25	0.50	0.25	0.59	0.38
30.....	0.58	0.37	0.50	0.25	0.50	0.25	0.59	0.38
31.....	0.54	0.31	0.50	0.25	.....	.....	0.59	0.38

a to a Gauge heights affected by beaver dam; correction applied.

MONTHLY DISCHARGE of Middle Creek at MacKinnon's Ranch, for 1914.

(Drainage area 121 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (16-18).....	57.00	34.00	46.00	0.382	0.040	275
April.....	88.00	1.72	37.00	0.304	0.240	2,202
May.....	12.00	0.37	1.09	0.009	0.010	67
June.....	1.60	0.37	4.90	0.004	0.004	29
July.....	0.85	0.31	0.64	0.005	0.006	39
August.....	0.45	0.25	0.36	0.003	0.003	22
September.....	0.38	0.25	0.28	0.002	0.003	16
October.....	4.70	0.25	0.54	0.004	0.005	33
The period.....	.....	.....	.....	.....	0.410	2,683

MIDDLE CREEK AT ROSS' RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 30, Tp. 5, Rge. 29, W. 3rd Mer., at Maurice Ross' ranch.

Records available.—From July 20, 1909, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 3,291.61 feet during 1909-10; 3,290.99 feet during 1911; 3,290.98 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; elevation, 3,297.37 feet above sea level (Irrigation Surveys).

SESSIONAL PAPER No. 25c

Channel.—Practically permanent.

Discharge measurements.—Made by wading or with a weir.

Winter flow.—Station discontinued during winter season.

Artificial control.—The flow at this station is regulated to some extent by two dams, one at W. X. Wright's and the other at MacKinnon's ranch.

Diversions.—Water is diverted for irrigation above this station by W. X. Wright and Angus MacKinnon.

Observer.—Mrs. W. M. Ross.

DISCHARGE MEASUREMENTS of Middle Creek at Ross' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 23.	H. R. Carscallen	14.5	7.02	0.43	0.88	3.00
April 4.	do	14.3	8.60	0.68	1.06	5.90
April 7.	do	32.0	42.00	1.42	2.42	60.00
April 8.	do	38.0	80.20	1.83	3.46	147.00
April 11.	do	29.5	28.80	1.41	1.99	40.00
April 24.	do	11.1	8.03	1.37	1.21	11.00
April 27.	H. W. Rowley	10.5	5.68	0.80	1.01	4.60
June 5.	do	.a			0.71	0.53
July 9.	do	.a			0.67	0.31
Sept. 2.	do	.a			0.65	0.25
Oct. 5.	do	.a			0.66	0.52
Oct. 22.	do	.a			0.62	0.29

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Ross' Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			1.00a	4.70	0.70	0.56	0.66	0.34
2.			1.50a	19.00	0.66	0.34	0.66	0.34
3.			2.46	66.00	0.70	0.56	0.66	0.34
4.			1.26	11.00	0.70	0.56	0.66	0.34
5.			1.33	13.30	0.69	0.51	0.67	0.39
6.			2.57	73.00	0.66	0.34	0.69	0.51
7.			2.26	54.00	0.66	0.34	0.70	0.56
8.			3.37	139.00	0.66	0.34	0.69	0.51
9.			2.74	85.00	0.66	0.34	0.66	0.34
10.			1.94	37.00	0.66	0.34	0.66	0.34
11.			1.93	36.00	0.66	0.34	0.70	0.56
12.			1.87	33.00	0.66	0.34	0.70	0.56
13.			1.97	38.00	0.66	0.34	0.74	0.85
14.			2.98	103.00	0.66	0.34	0.74	0.85
15.	1.79	30.00	3.20	123.00	0.66	0.34	0.69	0.51
16.	1.77a	29.00	3.03	108.00	0.66	0.34	0.66	0.34
17.	1.73a	27.00	2.88	95.00	0.66	0.34	0.66	0.34
18.	1.70a	26.00	2.59	74.00	0.66	0.34	0.66	0.34
19.	1.66a	25.00	2.16	48.00	0.66	0.34	0.66	0.34
20.	1.62a	23.00	1.63	24.00	0.66	0.34	0.66	0.34
21.	1.58	22.00	0.97	4.10	0.66	0.34	0.66	0.34
22.	0.89	2.80	0.98	4.30	0.66	0.34	0.66	0.34
23.	0.87	2.40	1.28	11.70	0.66	0.34	0.66	0.34
24.	0.78	1.25	1.21	9.60	0.68	0.45	0.66	0.34
25.	0.75a	0.91	1.20	9.30	0.66	0.34	0.69	0.51
26.	0.75a	0.94	0.90	2.90	0.66	0.34	0.68	0.45
27.	0.75a	0.94	0.88	2.60	0.66	0.34	0.66	0.34
28.	0.80a	1.46	0.84	2.00	0.66	0.34	0.66	0.34
29.	0.80a	1.46	0.79	1.36	0.66	0.34	0.66	0.34
30.	0.90a	2.90	0.74	0.86	0.66	0.34	0.66	0.34
31.	1.00a	4.70			0.66	0.34		

a Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Ross' Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.66	0.34	0.63	0.22	0.64	0.25	0.63	0.22
2.....	0.66	0.34	0.61	0.15	0.64	0.25	0.63	0.22
3.....	0.66	0.34	0.61	0.15	0.64	0.25	0.64	0.25
4.....	0.66	0.34	0.61	0.15	0.64	0.25	0.68	0.45
5.....	0.66	0.34	0.62	0.18	0.64	0.25	0.69	0.51
6.....	0.66	0.34	0.62	0.18	0.64	0.25	0.68	0.45
7.....	0.66	0.34	0.62	0.18	0.64	0.25	0.65	0.29
8.....	0.66	0.34	0.62	0.18	0.64	0.25	0.72	0.67
9.....	0.66	0.34	0.62	0.18	0.64	0.25	0.66	0.34
10.....	0.66	0.34	0.62	0.18	0.64	0.25	0.65	0.29
11.....	0.66	0.34	0.63	0.22	0.65	0.29	0.64	0.25
12.....	0.66	0.34	0.63	0.22	0.66	0.34	0.63	0.22
13.....	0.66	0.34	0.63	0.22	0.67	0.39	0.63	0.22
14.....	0.66	0.34	0.63	0.22	0.66	0.34	0.63	0.22
15.....	0.66	0.34	0.63	0.22	0.65	0.29	0.63	0.22
16.....	0.66	0.34	0.63	0.22	0.65	0.29	0.63	0.22
17.....	0.66	0.34	0.64	0.25	0.65	0.29	0.63	0.22
18.....	0.66	0.34	0.64	0.25	0.64	0.25	0.63	0.22
19.....	0.65	0.29	0.66	0.34	0.64	0.25	0.63	0.22
20.....	0.65	0.29	0.65	0.29	0.64	0.25	0.63	0.22
21.....	0.64	0.25	0.64	0.25	0.64	0.25	0.63	0.22
22.....	0.62	0.18	0.64	0.25	0.63	0.22	0.66	0.34
23.....	0.62	0.18	0.64	0.25	0.63	0.22	0.70	0.56
24.....	0.60	0.11	0.64	0.25	0.63	0.22	0.70	0.56
25.....	0.60	0.11	0.66	0.34	0.63	0.22	0.70	0.56
26.....	0.60	0.11	0.64	0.25	0.63	0.22	0.70	0.56
27.....	0.60	0.11	0.64	0.25	0.63	0.22	0.70	0.56
28.....	0.60	0.11	0.64	0.25	0.63	0.22	0.70	0.56
29.....	0.63	0.22	0.64	0.25	0.63	0.22	0.70	0.56
30.....	0.66	0.34	0.64	0.25	0.63	0.22	0.70	0.56
31.....	0.64	0.25	0.64	0.25	.....	.....	0.70	0.56

MONTHLY DISCHARGE of Middle Creek at Ross' Ranch, for 1914.

(Drainage area 162 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (15-31).....	30.00	0.94	11.90	0.0735	0.050	400
April.....	139.00	0.86	41.00	0.2540	0.280	2,446
May.....	0.56	0.34	0.37	0.0023	0.003	23
June.....	0.85	0.34	0.42	0.0026	0.003	25
July.....	0.34	0.11	0.28	0.0017	0.002	17
August.....	0.34	0.15	0.23	0.0014	0.002	14
September.....	0.39	0.22	0.26	0.0016	0.002	15
October.....	0.67	0.22	0.37	0.0023	0.003	23
The period.....	.....	.....	.....	.....	0.34	2,963

SESSIONAL PAPER No. 25c

MIDDLE CREEK AT HAMMOND'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 4, Tp. 2, Rge. 29, W. 3rd Mer., at D. A. Hammond's ranch.
Records available.—June 13, 1910, to October 31, 1911.

Gauge.—Vertical staff; elevation of zero of gauge 87.48 feet during 1910; 87.60 feet during 1911-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Slightly shifting during high water stages.

Discharge measurements.—Made by wading or with a weir.

Winter flow.—Station discontinued during winter season.

Diversions.—Water is diverted above this station by Mr. Lynch, Mr. Peachy and Mr. Jahn.
Observer.—Mrs. D. A. Hammond.

DISCHARGE MEASUREMENTS of Middle Creek at Hammond's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 18.....	H. D. St. A. Smith.....	21.0	40.5	0.59	3.17	24.00
Mar. 21.....	do.....	11.0	6.5	1.32	2.32	8.70
Mar. 30.....	do.....	10.0	6.9	0.75	2.07	5.20
April 3.....	do.....	22.0	26.4	1.45	3.14	38.40
April 9.....	do.....	27.0	111.0	1.17	4.44	129.00
April 10.....	do.....	24.0	118.0	1.19	4.58	141.00
April 13.....	do.....	23.0	29.4	1.62	3.29	48.00
April 24.....	H. W. Rowley.....	9.5b	4.7	1.89	2.06	9.00
May 21.....	do.....	a			1.49	0.10
May 25.....	do.....	a			1.46	0.06
June 17.....	do.....				1.29	Nil.
July 15.....	do.....				Dry.	"
Aug. 26.....	do.....				"	"
Oct. 26.....	do.....				1.05	"

a Weir measurement.

b Measurement made below gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Hammond's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.12	41.0	1.91	5.20	a	Nil.
2.....			3.82	78.0	1.86	4.36	a	"
3.....			3.17	40.0	1.82	3.80	a	"
4.....			2.92	30.0	1.79	3.40	1.44	0.02
5.....			3.02	35.0	1.73	2.70	1.44	0.02
6.....			3.37	52.0	1.70	2.30	1.41	Nil.
7.....			2.92	33.0	1.67	2.00	1.39	"
8.....			3.57	64.0	1.67	2.00	1.39	"
9.....			4.44	129.0	1.65	1.80	1.39	"
10.....			4.57	140.0	1.64	1.70	1.37	"
11.....			3.32	50.0	1.62	1.50	1.37	"
12.....			3.39	54.0	1.61	1.40	a	"
13.....	4.12	40.0	3.31	50.0	1.59	1.20	a	"
14.....	5.12	58.0	3.21	45.0	1.58	1.10	a	"
15.....	5.12	58.0	4.16	106.0	1.57	1.00	a	"
16.....	4.62	50.0	4.26	114.0	1.56	0.90	a	"
17.....	4.12	40.0	4.31	118.0	1.53	0.64	1.29	"
18.....	3.17	24.0	4.21	110.0	1.52	0.56	a	"
19.....	3.02	22.0	4.06	98.0	1.50	0.40	a	"
20.....	2.72	16.0	3.76	76.0	1.48	0.26	a	"
21.....	2.32	8.7	3.47	58.0	1.48	0.26	a	"
22.....	2.12	5.5	3.17	43.0	1.41	Nil.	a	"
23.....	2.07	4.5	2.87	31.0	1.41	"	a	"
24.....	2.07	4.5	2.62	23.0	1.40	"	a	"
25.....	2.02	3.8	2.32	13.9	1.40	"	a	"
26.....	2.02	3.8	2.22	11.5	1.40	"	c	"
27.....	2.02	3.8	2.22	11.5	1.39	"	a	"
28.....	2.00	3.2	2.17	10.4	1.39	"	a	"
29.....	1.97	3.0	2.12	9.4	1.39	"	a	"
30.....	1.97	3.0	1.99	6.8	1.38	"	a	"
31.....	2.92	31.0			1.38	"		

a Water in pools.

DAILY GAUGE HEIGHT AND DISCHARGE of Middle Creek at Hammond's Ranch, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	2.35	14.70
5.....	"	"	"	"	"	"	2.40	16.10
6.....	"	"	"	"	"	"	2.40	16.10
7.....	"	"	"	"	"	"	2.42	16.70
8.....	"	"	"	"	"	"	2.40	16.10
9.....	"	"	"	"	"	"	2.38	15.50
10.....	"	"	"	"	"	"	2.35	14.70
11.....	"	"	"	"	"	"	2.30	13.40
12.....	"	"	"	"	"	"	2.30	13.40
13.....	"	"	"	"	"	"	2.20	11.10
14.....	"	"	"	"	"	"	2.20	11.10
15.....	"	"	"	"	"	"	2.10	9.00
16.....	"	"	"	"	"	"	2.05	8.00
17.....	"	"	"	"	"	"	2.05	8.00
18.....	"	"	"	"	"	"	1.90	5.00
19.....	"	"	"	"	"	"	1.75	2.90
20.....	"	"	"	"	"	"	1.62	1.50
21.....	"	"	"	"	"	"	1.60	1.30
22.....	"	"	"	"	"	"	1.55	0.80
23.....	"	"	"	"	"	"	1.48	0.26
24.....	"	"	"	"	"	"	1.40	Nil.
25.....	"	"	"	"	"	"	1.40	"
26.....	"	"	"	"	"	"	Dry.	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Middle Creek at Hammond's Ranch, for 1914.

(Drainage area 316 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	58.00	3.00	20.00	0.0633	0.050	759
April.....	140.00	6.80	56.00	0.1770	0.200	3,332
May.....	5.20	0.00	1.24	0.0039	0.004	76
June.....	0.00	0.00	0.00	0.0000	0.000	Nil.
July.....	.....	.....	.....	.....	.....	..
August.....	.....	.....	.....	.....	.....	..
September.....	.....	.....	.....	.....	.....	..
October.....	16.70	0.00	6.30	0.0260	0.020	388
The period.....	.....	.....	.....	.....	0.274	4,555

LODGE CREEK AT WILLOW CREEK POLICE DETACHMENT.

Location.—On the SE. $\frac{1}{4}$ Sec. 12, Tp. 1, Rge. 29, W. 3rd Mer., at the Willow Creek R.N.W.M.P. detachment.

Records available.—From April 25, 1910, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 2,722.98 feet during 1910; 2,721.18 feet during 1911; 2,721.06 feet during 1912-14.

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Bench-mark.—Permanent iron bench-mark located on the right bank at the cable support; elevation, 2,734.02 feet above mean sea level (International Boundary Survey).

Channel.—Practically permanent.

Discharge measurements.—Made at station from cable car by wading or with a weir.

Winter flow.—Station discontinued during winter season.

Observer.—Chas. Hayes.

DISCHARGE MEASUREMENTS of Lodge Creek at Willow Creek Police Detachment, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 16.	H. D. St. A. Smith.	86.0	212.0	2.64	5.25	559.00
Mar. 18.	do	48.0	81.2	2.52	3.73	204.00
Mar. 21.	do	27.0	39.2	2.13	2.73	64.00
May 30.	do	9.5	5.9	2.15	1.68	12.70
April 1.	do	19.0	21.6	0.80	1.93	17.20
April 3.	do	43.0	63.0	3.59	3.88	225.00
April 6.	do	46.0	61.2	3.59	3.89	220.00
April 7.	do	55.0	123.0	2.95	4.53	363.00
April 30.	H. W. Rowley	21.0	13.0	1.56	2.05	20.00
May 21.	do	4.5	2.6	1.03	1.47	2.60
May 23.	do	4.5	2.1	1.00	1.40	2.10
June 18.	do				1.00	Nil.
July 13.	do				Dry.	"
Aug. 10.	do				"	"
Aug. 27.	do				"	"
Sept. 28.	do				"	"
Oct. 26.	do				1.25	0.66
Oct. 31.	do				1.18	0.31

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Willow Creek Police Detachment, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			3.15	112	1.84	13.60	1.14	0.22
2.			3.24	123	1.80	12.00	1.12	0.16
3.			4.46	347	1.74	10.60	1.10	0.10
4.			3.60	175	1.71	9.40	1.12	0.16
5.			3.57	170	1.69	8.70	1.11	0.13
6.			3.99	244	1.72	9.80	1.16	0.28
7.			4.51	360	1.66	7.80	1.17	0.31
8.			3.87	221	1.60	6.00	1.13	0.19
9.			3.33	135	1.65	7.50	1.11	0.13
10.			3.77	203	1.52	4.30	1.08	0.08
11.			3.21	119	1.51	4.10	1.08	0.08
12.			2.77	72	1.50	3.90	1.09	0.09
13.			2.90	85	1.48	3.60	1.12	0.16
14.			3.07	103	1.65	7.50	1.12	0.16
15.	3.35	138.0	3.25	124	1.85	14.00	1.10	0.10
16.	5.23	554.0	3.85	217	1.85	14.00	1.08	0.08
17.	5.03	496.0	3.64	181	1.68	8.40	1.04	0.04
18.	3.70	191.0	3.56	169	1.61	6.30	1.02	0.02
19.	3.16	113.0	3.12	108	1.53	4.50	0.97	Nil.
20.	2.65	62.0	2.86	81	1.46	3.30	0.94	"
21.	2.67	63.0	2.67	63	1.48	3.60	0.96	"
22.	2.48	48.0	2.53	51	1.43	2.80	0.95	"
23.	2.41	43.0	2.42	43	1.40	2.30	0.90	"
24.	2.20	30.0	2.34	38	1.40	2.30	0.85	"
25.	1.84	13.6	2.24	32	1.39	2.20	0.90	"
26.	1.73	10.2	2.10	25	1.35	1.70	0.95	"
27.	1.71	9.4	2.10	25	1.30	1.10	0.88	"
28.	1.61	6.3	2.12	26	1.27	0.89	0.90	"
29.	1.67	8.1	2.12	26	1.22	0.54	0.89	"
30.	1.70	9.0	2.06	23	1.20	0.40	0.88	"
31.	1.85	14.0			1.16	0.28		

DAILY GAUGE HEIGHT AND DISCHARGE of Lodge Creek at Willow Creek Police Detachment,
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.84	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	0.82	"	"	"	"	"	"	"
3.....	0.74	"	"	"	"	"	"	"
4.....	0.69	"	"	"	"	"	"	"
5.....	0.64	"	"	"	"	"	1.18	0.34
6.....	0.60	"	"	"	"	"	1.20	0.40
7.....	0.52	"	"	"	"	"	1.12	0.16
8.....	0.46	"	"	"	"	"	1.70	9.00
9.....	0.40	"	"	"	"	"	3.72	194.00
10.....	Dry.	"	"	"	"	"	3.35	138.00
11.....	"	"	"	"	"	"	2.90	85.00
12.....	"	"	"	"	"	"	2.40	42.00
13.....	"	"	"	"	"	"	2.00	20.00
14.....	"	"	"	"	"	"	1.88	15.20
15.....	"	"	"	"	"	"	1.78	12.20
16.....	"	"	"	"	"	"	1.70	9.00
17.....	"	"	"	"	"	"	1.68	8.40
18.....	"	"	"	"	"	"	1.60	6.00
19.....	"	"	"	"	"	"	1.60	6.00
20.....	"	"	"	"	"	"	1.52	4.30
21.....	"	"	"	"	"	"	1.42	2.60
22.....	"	"	"	"	"	"	1.42	2.60
23.....	"	"	"	"	"	"	1.30	1.10
24.....	"	"	"	"	"	"	1.28	0.96
25.....	"	"	"	"	"	"	1.26	0.82
26.....	"	"	"	"	"	"	1.25	0.75
27.....	"	"	"	"	"	"	1.24	0.68
28.....	"	"	"	"	"	"	1.21	0.47
29.....	"	"	"	"	"	"	1.20	0.40
30.....	"	"	"	"	"	"	1.19	0.37
31.....	"	"	"	"	"	"	1.18	0.34

MONTHLY DISCHARGE of Lodge Creek at Willow Creek Police Detachment, for 1914.

(Drainage area 824 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (15-31).....	554.00	6.30	106.00	0.1290	0.0800	3,587
April.....	360.00	23.00	123.00	0.1490	0.1700	7,319
May.....	14.00	0.28	5.70	0.0069	0.0080	350
June.....	0.31	Nil.	0.08	0.0001	0.0001	5
July.....	0.00	"	Nil.	Nil.	Nil.	Nil.
August.....	0.00	"	"	"	"	"
September.....	0.00	"	"	"	"	"
October.....	194.00	"	18.10	0.0220	0.0200	1,113
The period.....					0.28	12,374

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MISCELLANEOUS DISCHARGE MEASUREMENTS made in Lodge Creek drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Discharge.	
				Imperial gallons per 24 hours.	Sec.-ft.
Oct. 21....	H. W. Rowley.....	Adams' Spring.....	NW. 32-5-1-4.....	290	0.00054
May 19....	do.....	Links' Spring.....	NW. 32-5-1-4.....	922	0.00172
June 16....	do.....	do.....	do.....	443	0.00082
July 7....	do.....	do.....	do.....	702	0.00132
July 31....	do.....	do.....	do.....	939	0.00175
Aug. 25....	do.....	do.....	do.....	934	0.00174
Sept. 25....	do.....	do.....	do.....	897	0.00167
Oct. 21....	do.....	do.....	do.....	910	0.00169

BATTLE CREEK DRAINAGE BASIN.

General Description.

Battle Creek rises in Township 8, Range 2, West of the 4th Meridian, and flows in an easterly direction for about eight miles, where it crosses the 4th Meridian, then turns in a southeasterly direction and crosses the international boundary in Section 3, Township 1, Range 26, West of the 3rd Meridian, eventually emptying into Milk River near Chinook, Montana. As is characteristic of the streams in this locality, the valley is narrow and deep near the source and gradually broadens out into large flats and meadows. These large flats are first noticed in the vicinity of Battle Creek P.O. Near the head of the stream the valley is well wooded with fair-sized timber, but this diminishes to a growth of willow brush along the banks and finally disappears altogether.

The chief tributaries of Battle Creek are Tennile Creek, joining it in Section 4, Township 6, Range 29, West of the 3rd Meridian, and Sixmile Coulee, joining it in Section 21, Township 6, Range 29, West of the 3rd Meridian. Stations have been established on both of these streams.

There are three stations on Battle Creek, at the following places: Nash's ranch, Wilkes' ranch, and Tennile police detachment.

Although it will be several years before it reaches its fullest development, the irrigation of the flats along the creek is increasing every year. This, it is expected, will result in a more uniform flow in the creek, as a certain amount of the water diverted by the irrigation ditches will be returned to the creek through seepage.

The principal irrigation schemes taking water from Battle Creek are: Marshall and Gaff's and W. S. Wilson's, near Tennile police detachment; Richardson's and McKinnon's near Kelvinhurst; Gilchrist's, and Stirling and Nash's near Consul.

SPANGLER DITCH FROM SIXMILE COULEE.

Location.—On the SW. $\frac{1}{4}$ Sec. 6, Tp. 7, Rge. 28, W. 3rd Mer., at Spangler's ranch.

Records available.—For the irrigation seasons of 1912-14.

Gauge.—Vertical staff; zero of gauge has been maintained at 96.57 feet since establishment.

Bench-mark.—The top of the I.P. stake; assumed elevation, 100.00 feet.

Channel.—Composed of soft clay.

Discharge measurements.—Made by wading or with a weir.

Observer.—J. M. Spangler.

DISCHARGE MEASUREMENTS of Spangler Ditch from Sixmile Coulee, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 28.....	H. W. Rowley.....	5.0	1.50	0.63	1.49	0.95
June 23.....	do.....	5.0	1.40	0.48	1.44	0.58
Nov. 4.....	do.....	.....^a	.....	.....	1.39	0.36

^a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Spangler Ditch from Sixmile Coulee, for 1914.

DAY.	May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			1.58	1.91	1.43	0.54
2.....			1.55	1.55	1.39	0.35
3.....			1.58	1.91	1.35	0.23
4.....	1.55 ^a	1.55	1.70	3.60	1.32 ^c	0.15
5.....	^b	Nil.	1.75	4.40		
6.....	^b	^a	1.79	5.00		
7.....	1.54	1.45	1.75	4.40		
8.....	1.53	1.35	1.74	4.20		
9.....	1.59 ^c	2.00	1.73	4.10		
10.....			1.72	4.00		
11.....			1.72	4.00		
12.....			1.74 ^c	4.20		
13.....						
14.....						
15.....						
16.....						
17.....						
18.....						
19.....						
20.....						
21.....	1.59 ^a	2.00				
22.....	1.59	2.00	1.55 ^a	1.55		
23.....	1.61	2.30	1.45	0.64		
24.....	1.60	2.20	1.37	0.30		
25.....	1.54	1.45	1.45	0.64		
26.....	1.47	0.80	1.60	2.20		
27.....	1.49	0.96	1.55	1.55		
28.....	1.49	0.96	1.52	1.24		
29.....	1.49	0.96	1.50	1.04		
30.....	1.47	0.80	1.47	0.80		
31.....	1.48	0.88				

^a Headgate opened.^b Ditch filled with snow.^c Headgate closed.

MONTHLY DISCHARGE of Spangler Ditch from Sixmile Coulee, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May { 4-9 } 21-31	2.30	0.00	1.28			43
June { 1-12 } 22-30	5.00	0.30	2.50			105
July (1-4).....	0.54	0.15	0.32			2
The period.....						150

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SIXMILE COULEE AT SPANGLER'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 6, Tp. 7, Rge. 28, W. 3rd Mer., near Mr. Spangler's house. The present station is 850 feet north of the former station established July 4, 1911.

Records available.—At former station, 850 feet downstream from July 3, 1911, to November 7, 1911. At present station—April 13, 1912, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 90.68 feet (original station), during 1911; 96.73 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark located on the left bank 850 feet below gauge rod.

Channel.—Practically permanent.

Discharge measurements.—Made by wading or with weir.

Winter flow.—Station discontinued during winter season.

Diversions.—Water is diverted by J. M. Spangler for irrigation one-half mile above.

Observer.—D. B. Spangler.

DISCHARGE MEASUREMENTS of Sixmile Coulee at Spangler's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 5.....	H. W. Rowley	<i>a</i>	.....	.....	1.56	0.18
June 23.....	do	<i>a</i>	.....	.....	1.65	0.45
July 16.....	do	.....	.....	.....	1.40	Nil.
July 20.....	do	.....	.....	.....	1.55	"
Aug. 1.....	do	.....	.....	.....	0.73	"
Aug. 11.....	do	.....	.....	.....	Dry.	"
Sept. 3.....	do	.....	.....	.....	0.47	"
Nov. 4.....	do	<i>a</i>	.....	.....	1.57	0.08

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Sixmile Coulee at Spangler's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.03	4.00	1.55	0.10
2.....	2.01	3.10	1.57	0.14
3.....	2.00	3.60	1.60	0.20
4.....	4.05	.....	1.97	3.20	1.60	0.20
5.....	4.87	.....	1.95	3.00	1.60	0.20
6.....	4.81	.....	2.10	5.00	1.65	0.40
7.....	4.25	.....	1.97	3.20	1.64	0.36
8.....	4.13	.....	1.94	2.90	1.64	0.36
9.....	3.67	.....	2.41	10.50	1.62	0.28
10.....	3.47 ^b	.....	2.23	7.10	1.60	0.20
11.....	3.33	29.0	2.23	7.10	1.59	0.18
12.....	3.49	32.0	2.19	6.40	1.61	0.24
13.....	4.00	42.0	2.15	5.80	2.15	5.80
14.....	4.07	43.0	2.11	5.20	2.30	8.40
15.....	4.07 ^a	.....	3.89	40.0	2.07	4.60	2.20	6.60
16.....	3.55	.....	3.72	36.0	2.01	3.70	2.15	5.80
17.....	3.40	.....	3.43	31.0	2.02	3.90	2.05	4.30
18.....	3.28	.....	3.27	27.0	2.01	3.70	2.00	3.60
19.....	2.85	.....	3.05	23.0	2.00	3.60	1.90	2.40
20.....	2.86	19.5	2.00	3.60	1.75	1.00
21.....	2.44	11.1	1.87	2.10	1.73	0.88
22.....	2.44	11.1	1.87	2.10	1.65	0.40
23.....	2.41	10.5	1.86	2.00	1.56	0.12
24.....	2.31	8.6	1.91	2.50	1.52	0.05
25.....	2.23	7.1	1.88	2.20	1.53	0.07
26.....	2.21	6.8	1.84	1.80	1.82	1.60
27.....	2.17	6.1	1.55	0.10	1.76	1.08
28.....	2.13	5.5	1.54	0.08	1.70	0.70
29.....	2.11	5.2	1.54	0.08	1.69	0.64
30.....	2.09	4.9	1.55	0.10	1.68	0.58
31.....	1.53	0.07	.....	.....

a to *b* Gauge heights affected by ice; not sufficient data to estimate discharge.

c Frozen solid.

DAILY GAUGE HEIGHT AND DISCHARGE of Sixmile Coulee at Spangler's Ranch, for 1914.

—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.64	0.36	0.75	Nil.	0.45	Nil.	0.86	Nil.
2.....	1.61	0.24	0.71	"	0.43	"	0.87	"
3.....	1.56	0.12	0.69	"	0.39	"	0.89	"
4.....	1.50	0.10	0.65	"	0.37	"	1.27	"
5.....	1.50	0.10	0.59	"	0.35	"	1.47	0.01
6.....	1.50	0.10	0.55	"	Dry.	"	1.51	0.04
7.....	1.50	0.10	0.52	"	"	"	1.57	0.14
8.....	1.48	0.01	0.51	"	"	"	1.90	2.40
9.....	1.47	0.01	0.51	"	"	"	2.03	4.00
10.....	1.47	0.01	0.53	"	"	"	1.95	3.00
11.....	1.52	0.05	0.53	"	"	"	1.90	2.40
12.....	1.47	0.01	0.53	"	"	"	1.85	1.90
13.....	1.45	Nil.	0.51	"	0.75	"	1.80	1.40
14.....	1.42	"	0.48	"	0.81	"	1.77	1.16
15.....	1.40	"	0.45	"	0.85	"	1.73	0.88
16.....	1.38	"	0.43	"	0.85	"	1.70	0.70
17.....	1.42	"	0.40	"	0.86	"	1.68	0.58
18.....	1.29	"	0.45	"	0.87	"	1.66	0.46
19.....	1.25	"	0.50	"	0.87	"	1.65	0.40
20.....	1.20	"	0.47	"	0.88	"	1.64	0.36
21.....	1.17	"	0.45	"	0.88	"	1.63	0.32
22.....	1.15	"	0.43	"	0.87	"	1.61	0.24
23.....	1.13	"	0.40	"	0.87	"	1.60	0.20
24.....	1.06	"	0.50	"	0.86	"	1.60	0.20
25.....	1.00	"	0.52	"	0.86	"	1.59	0.18
26.....	0.97	"	0.52	"	0.85	"	1.57	0.14
27.....	0.92	"	0.51	"	0.85	"	1.56	0.12
28.....	0.88	"	0.50	"	0.85	"	1.55	0.10
29.....	0.84	"	0.47	"	0.85	"	1.55	0.10
30.....	0.79	"	0.46	"	0.86	"	1.54	0.08
31.....	0.77	"	0.46	"			1.53	0.07

MONTHLY DISCHARGE of Sixmile Coulee at Spangler's Ranch, for 1914.

(Drainage area 42 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March.....	a					
April (11-30).....	43.00	4.90	20.00	0.47600	0.350	791.0
May.....	10.50	0.07	3.40	0.08140	0.094	209.0
June.....	8.40	0.05	1.57	0.03730	0.042	93.0
July.....	0.36	0.00	0.04	0.00095	0.001	2.5
August.....	0.00	0.00	0.00	0.00000	0.000	0.0
September.....	0.00	0.00	0.00	0.00000	0.000	0.0
October.....	4.00	0.00	0.71	0.01700	0.020	44.0
The period.....					0.510	1,140.0

a Ice conditions Mar. 15 to April 10; insufficient data to compute discharge.

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LINDNER DITCH FROM BATTLE CREEK.

Location.—On the NW. $\frac{1}{4}$ Sec. 10, Tp. 6, Rge. 29, W. 3rd Mer., near Tennile police detachment.

Records available.—For the irrigation seasons of 1910-14.

Gauge.—Vertical staff.

Channel.—Composed of gravel and clay loam.

Discharge measurements.—Made with a 42-inch weir, which is permanently installed in the ditch.

Observer.—Phil. Lindner.

Remarks.—This is a weir station, consisting of a 42-inch sharp-crested weir with complete end contractions. The elevation of the crest of the weir was kept at a gauge height of 1.04 feet during 1914.

DAILY GAUGE HEIGHT AND DISCHARGE of Lindner Ditch from Battle Creek, for 1914.

DAY.	April.		May.		June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			1.70	6.00	1.28	1.34		
2			1.70	6.00	1.30	1.53		
3			1.70	6.00	1.30	1.53		
4			1.70	6.00	1.30	1.53		
5			1.75 ^b	6.70	1.36	2.10	1.40 ^a	2.50
6					1.37	2.20	1.40	2.50
7					1.38	2.30	1.40	2.50
8					1.38	2.30	1.40	2.50
9					1.40	2.50	1.40	2.50
10					1.40 ^b	2.50	1.38	2.30
11							1.36	2.10
12							1.35	2.00
13							1.35	2.00
14							1.35	2.00
15							1.35 ^b	2.00
16								
17			1.53 ^a	3.90				
18			1.53	3.90				
19			1.53	3.90				
20			1.53	3.90				
21			1.53	3.90				
22			1.53	3.90				
23			1.53	3.90				
24			1.40	2.50				
25			1.40	2.50				
26			1.40	2.50				
27			1.38	2.30				
28			1.32	1.71				
29			1.30	1.53				
30	1.70 ^a	6.00	1.29	1.44				
31			1.27	1.26				

a Headgate opened.

b Headgate closed.

MONTHLY DISCHARGE of Lindner Ditch from Battle Creek, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (30)	6.00	6.00	6.00			12
May (1-5)	6.70	1.26	3.70			146
June (1-10)	2.50	1.34	1.98			39
July (5-15)	2.50	2.00	2.30			49
The period						246

TENMILE CREEK AT TENMILE POLICE DETACHMENT.

Location.—On the SE. $\frac{1}{4}$ Sec. 4, Tp. 6, Rge. 29, W. 3rd. Mer., near the Tenmile R.N.W.M.P. detachment. The original station about 500 feet above the junction of Tenmile Creek with Battle Creek was moved about 1,000 feet farther upstream on September 14, 1914.

Records available.—At original location of station—July 21, 1909, to September 14, 1914. At the new location of the station—September 14, 1914, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 93.38 feet during 1909-11; 91.72 feet during 1912; 89.24 feet during 1913; 90.83 feet March 15 to September 14, 1914. Zero of gauge (new station) maintained at 99.76 feet from September 14 to October 31, 1914.

Bench-mark.—Permanent iron bench-mark, assumed elevation 100.00 feet, located on the left bank at the original station, which is 6.70 feet above the permanent iron bench-mark at the highway bridge over Battle Creek.

Channel.—Practically permanent.

Discharge measurements.—Made by wading or with weir.

Winter flow.—Station discontinued during winter season.

Artificial control.—A large beaver dam in Battle Creek, just below the mouth of Tenmile Creek, has a noticeable effect on the gauge heights at the original station, but, as the gauge station is about 8 feet higher, the gauge readings at this station are not likely to be affected.

Observer.—R. W. Shafer, March to August. W. H. Tudgay, September and October.

DISCHARGE MEASUREMENTS of Tenmile Creek at Tenmile Police Detachment, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 25	H. R. Carscallen	<i>a</i>			1.80	0.88
April 27	H. W. Rowley	<i>a</i>			1.77	0.79
May 4	do	3.50	1.27	0.24	1.65	0.31
May 28	do				1.62	0.27
June 5	do	<i>a</i>			1.62	0.25
June 22	do				1.60	0.32
July 9	do	<i>a</i>			1.58	0.16
Aug. 1	do	<i>a</i>			1.58	0.17
Aug. 6	do	<i>a</i>			1.57	0.13
Sept. 2	do	<i>a</i>			1.67	0.15
Sept. 14	do	<i>a</i>			1.98	0.23
Sept. 15 ^b	do	<i>a</i>			0.59 ^c	0.12
Oct. 5 ^b	do	<i>a</i>			0.60 ^c	0.15
Oct. 23 ^b	do	<i>a</i>			0.59 ^c	0.10
Nov. 2 ^b	do	<i>a</i>			0.59 ^c	0.11

a Weir measurement.

b Measurement made at upper station.

c Gauge reading from rod at upper station.

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DAILY GAUGE HEIGHT AND DISCHARGE of Tennile Creek at Tennile Police Detachment,
for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.62	0.25	1.69	0.47	1.63	0.28
2.....			1.60	0.20	1.68	0.43	1.63	0.28
3.....			1.59	0.18	1.67	0.40	1.63	0.28
4.....			1.62	0.25	1.67	0.40	1.61	0.23
5.....			2.34	3.80	1.69	0.47	1.61	0.23
6.....			2.28	3.50	1.67	0.40	1.71	0.54
7.....			2.18	2.90	1.67	0.40	1.62	0.25
8.....			2.19	3.00	1.67	0.40	1.60	0.20
9.....			2.22	3.20	1.69	0.47	1.59	0.18
10.....			2.02	2.00	1.69	0.47	1.60	0.20
11.....			2.15	2.80	1.72	0.57	1.60	0.20
12.....			2.13	2.70	1.68	0.43	1.61	0.23
13.....			2.63	5.50	1.67	0.40	1.60	0.20
14.....			2.85	6.70	1.68	0.43	1.62	0.25
15.....			2.75	6.10	1.67	0.40	1.62	0.25
16.....	1.91	1.44	2.45	4.50	1.69	0.47	1.61	0.23
17.....	1.62	0.25	2.22	3.20	1.69	0.47	1.61	0.23
18.....	1.62	0.25	2.06	2.30	1.70	0.50	1.58	0.16
19.....	1.62	0.25	1.98	1.80	1.70	0.50	1.58	0.16
20.....	1.53	0.07	1.96	1.72	1.67	0.40	1.58	0.16
21.....	1.53	0.07	1.89	1.34	1.67	0.40	1.58	0.16
22.....	1.53	0.07	1.81	0.95	1.69	0.47	1.59	0.18
23.....	1.53	0.07	1.78	0.81	1.67	0.40	1.59	0.18
24.....	1.55	0.09	1.77	0.77	1.67	0.40	1.58	0.16
25.....	1.55	0.09	1.80	0.90	1.66	0.36	1.60	0.20
26.....	1.55	0.09	1.78	0.81	1.66	0.36	1.59	0.18
27.....	1.55	0.09	1.77	0.77	1.63	0.28	1.59	0.18
28.....	1.58	0.16	1.63	0.28	1.62	0.25	1.60	0.20
29.....	1.58	0.16	1.75	0.68	1.61	0.23	1.62	0.25
30.....	1.57	0.13	1.71	0.54	1.61	0.23	1.61	0.23
31.....	1.71	0.54			1.62	0.25		

DAILY GAUGE HEIGHT AND DISCHARGE of Tenmile Creek at Tenmile Police Detachment,
for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.60	0.20	1.56	0.11	1.68	0.16	0.61	0.17
2.....	1.59	0.18	1.58	0.16	1.68	0.16	0.61	0.17
3.....	1.59	0.18	1.59	0.18	1.69	0.16	0.63	0.23
4.....	1.60	0.20	1.56	0.11	1.70	0.16	0.63	0.23
5.....	1.59	0.18	1.59	0.18	1.70	0.16	0.60	0.14
6.....	1.59	0.18	1.58	0.13	1.70	0.16	0.61	0.17
7.....	1.57	0.13	1.57	0.13	1.69	0.16	0.62	0.20
8.....	1.56	0.11	1.59	0.14	1.70	0.16	0.62	0.20
9.....	1.59	0.18	1.61	0.14	1.70	0.16	0.61	0.17
10.....	1.59	0.18	1.62	0.14	1.70	0.16	0.61	0.17
11.....	1.59	0.18	1.59	0.14	1.70	0.16	0.60	0.14
12.....	1.58	0.16	1.60	0.14	1.71	0.17	0.60	0.14
13.....	1.58	0.16	1.61	0.14	1.87	0.21	0.60	0.14
14.....	1.56	0.11	1.60	0.14	0.60 ^a	0.14	0.60	0.14
15.....	1.59	0.18	1.61	0.14	0.59	0.11	0.59	0.11
16.....	1.60	0.20	1.61	0.14	0.59	0.11	0.59	0.11
17.....	1.57	0.13	1.60	0.14	0.59	0.11	0.59	0.11
18.....	1.54	0.08	1.64	0.15	0.59	0.11	0.59	0.11
19.....	1.59	0.18	1.65	0.15	0.61	0.17	0.59	0.11
20.....	1.57	0.13	1.68	0.16	0.62	0.20	0.59	0.11
21.....	1.57	0.13	1.64	0.15	0.62	0.20	0.60	0.14
22.....	1.56	0.11	1.64	0.15	0.62	0.20	0.59	0.11
23.....	1.56	0.11	1.64	0.15	0.62	0.20	0.59	0.11
24.....	1.58	0.16	1.66	0.15	0.62	0.20	0.59	0.11
25.....	1.55	0.09	1.66	0.15	0.61	0.17	0.59	0.11
26.....	1.56	0.11	1.67	0.16	0.61	0.17	0.59	0.11
27.....	1.56	0.11	1.69	0.16	0.61	0.17	0.59	0.11
28.....	1.57	0.13	1.69	0.16	0.61	0.17	0.59	0.11
29.....	1.56	0.11	1.70	0.16	0.61	0.17	0.59	0.11
30.....	1.58	0.16	1.69	0.16	0.61	0.17	0.59	0.11
31.....	1.56	0.11	1.69	0.16			0.59 ^b	0.11

^a ^b Gauge heights taken from new gauge 1,000 ft. upstream.

MONTHLY DISCHARGE of Tenmile Creek at Tenmile Police Detachment, for 1914.

(Drainage area 24 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (16-31).....	1.44	0.07	0.24	0.0100	0.006	7.6
April.....	6.70	0.18	2.00	0.0890	0.099	127.0
May.....	0.57	0.23	0.40	0.0170	0.020	24.8
June.....	0.54	0.16	0.22	0.0093	0.010	13.3
July.....	0.20	0.08	0.15	0.0062	0.007	9.1
August.....	0.18	0.11	0.15	0.0062	0.007	9.1
September.....	0.21	0.11	0.16	0.0068	0.008	9.7
October.....	0.23	0.11	0.14	0.0058	0.007	8.6
The period.....					0.164	209.0

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BATTLE CREEK AT TENMILE POLICE DETACHMENT.

Location.—On the NE. $\frac{1}{4}$ Sec. 33, Tp. 5, Rge. 29, W. 3rd Mer., at the highway bridge about one quarter mile south of Tenmile R.N.W.M.P. detachment and 300 yards north of the new Battle Creek post office.

Records available.—From June 3, 1909, to October 31, 1914.

Gauge.—Chain gauge, fastened to the guard rail on the downstream side of bridge. Zero of gauge maintained at 86.97 feet, length of chain (from marker to bottom of weight) 19.10 feet, during 1909-10. Zero of gauge maintained at 86.87 feet, length of chain 19.10 feet, during 1911. Zero of gauge maintained at 86.84 feet, length of chain 19.11 feet, during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Practically permanent, but might shift during extreme floods. Weeds in the channel affect the gauge heights at times during midsummer season.

Discharge measurements.—Made from downstream side of bridge during high water, and by wading or with weir some distance below during low water flow.

Winter flow.—Station discontinued during winter season.

Artificial control.—There are several large beaver dams above this station which have a tendency to keep the creek running at this point after the creek goes dry farther up towards its source in the Cypress Hills.

Diversions.—Lindner Brothers divert water for irrigation about two miles above.

Observer.—R. W. Shafer, March to August; W. H. Tudgay, September and October.

DISCHARGE MEASUREMENTS of Battle Creek at Tenmile Police Detachment, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 19.....	H. R. Carscallen.....	27.0	94.1	0.35	4.40	33.00
Mar. 21.....	do.....	26.5	65.9	0.34	3.37	22.00
Mar. 31.....	do.....	32.5	24.0	0.77	2.88	18.40
April 4.....	do.....	33.7	30.1	1.25	3.12	38.00
April 6.....	do.....	47.2	86.0	1.50	4.49	129.00
April 7.....	do.....	30.5	97.1	1.08	4.30	105.00
April 11.....	do.....	41.0	46.8	1.40	3.53	66.00
April 13.....	do.....	41.5	168.0	1.54	5.96	258.00
April 14.....	do.....	47.0	224.0	1.75	7.18	391.00
April 15.....	do.....	44.0	195.0	1.70	6.30	332.00
April 23.....	do.....	40.4	43.0	1.50	3.47	65.00
April 24.....	do.....	40.6	44.8	1.55	3.50	69.00
April 27.....	H. W. Rowley.....	32.0b	30.6	1.83	3.28	56.00
May 4.....	do.....	28.5b	21.4	1.59	2.97	34.00
May 28.....	do.....	24.0b	14.9	1.46	2.74	22.00
June 5.....	do.....	29.5b	19.1	1.18	2.79	22.00
June 22.....	do.....	14.0b	9.3	1.51	2.65	14.30
July 9.....	do.....	9.0b	3.5	0.82	2.31	2.90
Aug. 1.....	do.....	a			2.23	1.71
Aug. 9.....	do.....	a			2.20	1.11
Aug. 11.....	do.....	a			2.23	1.49
Sept. 2.....	do.....				2.33	3.00
Sept. 14.....	do.....	39.0b	36.8	0.94	3.20	36.00
Sept. 15.....	do.....	37.5b	31.1	0.75	2.90	23.00
Oct. 3.....	do.....	32.0b	18.2	0.50	2.54	9.00
Oct. 6.....	do.....	36.2b	25.6	0.74	2.78	19.10
Oct. 23.....	do.....	36.5b	28.0	0.77	2.78	22.00
Nov. 3.....	do.....	33.0b	20.7	0.71	2.65	14.70

a Weir measurements.

b Not taken at bridge section

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Tenmile Police Detachment,
for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.75	18.6	2.96	30.4	2.68	15.0
2.....			2.75	18.6	2.98	32.0	2.72	17.0
3.....			2.87	23.0	2.97	31.0	2.75	17.6
4.....			3.06	37.0	2.99	32.0	2.83	23.0
5.....			3.35	56.0	3.14	42.0	2.76	19.1
6.....			3.33	55.0	3.05	36.0	2.83	23.0
7.....			4.15	116.0	3.01	33.0	2.86	25.0
8.....			3.96	101.0	3.06	37.0	2.86	25.0
9.....			3.74	84.0	3.53	69.0	2.78	20.0
10.....			3.57	71.0	3.56	71.0	2.74	18.1
11.....			3.76	86.0	3.53	69.0	2.71	16.5
12.....			4.33	130.0	3.30	53.0	2.74	18.1
13.....			6.64	337.0	3.19	45.0	2.97	31.0
14.....			7.59	432.0	3.14	42.0	3.15	42.0
15.....			7.26	399.0	3.05	36.0	3.12	40.0
16.....	5.51	47a	6.50	323.0	3.06	37.0	2.91	27.0
17.....	4.84	30a	4.99	185.0	2.99	32.0	2.85	24.0
18.....	3.83	27a	4.09	112.0	2.96	30.0	2.74	18.1
19.....	3.96	28a	3.90	97.0	2.96	30.0	2.69	15.5
20.....	3.51	24a	3.85	93.0	2.96	30.0	2.65	13.4
21.....	3.44	23a	3.68	80.0	2.91	27.0	2.62	12.0
22.....	3.16	21a	3.44	62.0	2.87	25.0	2.62	12.0
23.....	3.01	20a	3.46	64.0	2.87	25.0	2.59	10.7
24.....	3.01	20a	3.50	66.0	2.88	26.0	2.55	9.1
25.....	3.11	21a	3.39	58.0	2.86	25.0	2.69	15.5
26.....	3.22	22a	3.39	58.0	2.83	23.0	2.71	16.5
27.....	3.04	20a	3.28	51.0	2.78	20.0	2.75	18.6
28.....	3.04	20a	3.20	46.0	2.73	17.6	2.69	15.5
29.....	3.00	20a	3.15	42.0	2.71	16.5	2.63	12.5
30.....	2.88	19a	3.01	33.0	2.70	16.0	2.59	10.7
31.....	2.88	19a			2.68	15.0		

a Ice conditions—discharge estimated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Tennile Police Detachment,
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.59	10.70	2.22	1.32	2.32	3.0	2.46	6.3
2.....	2.55	9.10	2.24	1.64	2.33	3.1	2.46	6.3
3.....	2.50	7.50	2.22	1.32	2.33	3.1	2.46	6.3
4.....	2.46	6.30	2.18	0.80	2.33	3.1	2.82	22.0
5.....	2.36	3.70	2.21	1.16	2.33	3.1	2.86	25.0
6.....	2.33	3.10	2.20	1.00	2.33	3.1	2.78	20.0
7.....	2.33	3.10	2.20	1.00	2.32	3.0	2.77	19.6
8.....	2.28	2.30	2.23	1.48	2.32	3.0	3.02	34.0
9.....	2.28	2.30	2.25	1.80	2.33	3.1	3.43	62.0
10.....	2.28	2.30	2.25	1.80	2.33	3.1	3.32	54.0
11.....	2.28	2.30	2.23	1.48	2.32	3.0	3.20	46.0
12.....	2.22	1.30	2.24	1.64	2.36	3.7	3.07	37.0
13.....	2.23	1.50	2.23	1.48	2.61	11.6	2.97	31.0
14.....	2.22	1.30	2.23	1.48	3.19	45.0	2.88	26.0
15.....	2.22	1.30	2.22	1.32	2.93	29.0	3.12	40.0
16.....	2.22	1.30	2.24	1.64	2.82	22.0	3.25	49.0
17.....	2.24	1.60	2.22	1.32	2.73	17.6	3.21	46.0
18.....	2.26	2.00	2.25	1.80	2.68	15.0	3.02	34.0
19.....	2.29	2.40	2.24	1.64	2.65	13.4	2.93	29.0
20.....	2.29	2.40	2.25	1.80	2.64	12.9	2.88	26.0
21.....	2.25	1.80	2.22	1.32	2.63	12.5	2.83	23.0
22.....	2.22	1.32	2.22	1.32	2.58	10.3	2.79	22.0
23.....	2.24	1.64	2.24	1.64	2.55	9.1	2.78	20.0
24.....	2.22	1.32	2.32	3.00	2.54	8.8	2.74	18.1
25.....	2.22	1.32	2.26	1.96	2.52	8.1	2.74	18.1
26.....	2.24	1.64	2.24	1.64	2.48	6.9	2.74	18.1
27.....	2.21	1.16	2.34	3.30	2.45	6.0	2.70	16.0
28.....	2.21	1.16	2.34	3.30	2.45	6.0	2.65	13.4
29.....	2.22	1.32	2.34	3.30	2.45	6.0	2.69	15.5
30.....	2.21	1.16	2.33	3.10	2.45	6.0	2.69	15.5
31.....	2.21	1.16	2.33	3.10			2.68	15.0

MONTHLY DISCHARGE of Battle Creek at Tennile Police Detachment, for 1914.

(Drainage area 210 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (16-31) <i>a</i>	47.00	19.00	24.00	0.116	0.070	773
April.....	432.00	18.60	111.00	0.530	0.591	6,605
May.....	71.00	15.00	34.00	0.162	0.187	2,091
June.....	42.00	9.10	19.40	0.092	0.103	1,154
July.....	10.70	1.16	2.67	0.013	0.015	164
August.....	3.30	0.80	1.80	0.009	0.010	111
September.....	45.00	0.30	9.45	0.045	0.050	562
October.....	62.00	6.30	26.30	0.125	0.144	1,617
The period.....					1.170	13,077

a Ice conditions during March; discharge estimated.

GAFF DITCH FROM BATTLE CREEK.

Location.—On the SW. $\frac{1}{4}$ Sec. 25, Tp. 5, Rge. 29, W. 3rd Mer., about one-half mile from Mr. Gaff's house near Tenmile police detachment.

Records available.—For the irrigation seasons of 1912-14.

Gauge.—Vertical staff; the zero of the gauge has been maintained at 96.90 feet since establishment.

Bench-mark.—The top of a wooden stake on the right bank; assumed elevation, 100.00 feet.

Channel.—Composed of sandy loam and somewhat grown over with grass and weeds.

Discharge measurements.—Made by wading or with a weir.

Observer.—W. D. Gaff.

DISCHARGE MEASUREMENTS of Gaff Ditch from Battle Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
May 27.....	H. W. Rowley.....	9.00	12.6	1.06	1.83	13.5
June 22.....	do.....	9.00	11.2	0.94	1.73	10.6
Oct. 23.....	do.....	7.70	4.4	0.71	0.83	3.2
Oct. 23.....	do.....	7.50	4.4	0.69	0.83	3.1

DAILY GAUGE HEIGHT AND DISCHARGE of Gaff Ditch from Battle Creek, in 1914.

DAY.	May.		June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			1.75	12.20	1.42	8.00
2.....			1.67	11.00	1.42	8.00
3.....			1.75	12.20	1.29	6.70
4.....			1.67	11.00		
5.....			1.87	14.10		
6.....			1.83	13.50		
7.....			1.83	13.50		
8.....			1.83	13.50		
9.....			1.83	13.50		
10.....			1.92	14.80		
11.....			1.83	13.50		
12.....			1.79	12.80		
13.....			1.92	14.80		
14.....	1.33	7.10	1.92	14.80		
15.....	1.50	9.00	1.92	14.80		
16.....	1.50	9.00	1.92	14.80		
17.....	1.60	10.30	1.83	13.50		
18.....	1.85	13.80	1.75	12.20		
19.....	1.96	15.40	1.83	13.50		
20.....	1.92	14.80	1.92	14.80		
21.....	2.04	16.70	1.83	13.50		
22.....	1.92	14.80	1.75	12.20		
23.....	1.87	14.10	1.67	10.00		
24.....	1.75	12.20	1.50	9.00		
25.....	1.50	9.00	1.50	9.00		
26.....	1.42	8.00	2.00	16.10		
27.....	1.83	13.50	2.05	16.70		
28.....	1.75	12.20	1.83	13.50		
29.....	1.67	11.00	1.67	11.00		
30.....	1.50	9.00	1.58	10.00		
31.....	1.50	9.00				

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MONTHLY DISCHARGE of Gaff Ditch from Battle Creek, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (14-31).....	16.70	7.10	11.60	.....	.....	414
June.....	16.70	9.00	13.00	.....	.....	774
July (1-3).....	8.00	6.70	7.40	.....	.....	44
The period.....	.....	.....	.....	.....	.....	1,232

WILSON DITCH FROM BATTLE CREEK.

Location.—On the NE. $\frac{1}{4}$ Sec. 34, Tp. 5, Rge. 28, W. 3rd Mer.

Records available.—Discharge measurements only in 1914.

Gauge.—Plain staff; elevation 96.28 feet.

Bench-mark.—Permanent iron bench-mark on left bank; assumed elevation, 100.00 feet.

Observer.—No observations in 1914.

DISCHARGE MEASUREMENTS of Wilson Ditch from Battle Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 20.....	H. W. Rowley.....	.....	.....	.....	0.88	0.53
May 27.....	do.....	6.5	2.23	1.01	1.13	2.20

BATTLE CREEK AT WILKES' RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 33, Tp. 5, Rge. 27, W. 3rd Mer., at R. W. Wilkes' ranch, 12 miles east of the Tennile R.N.W.M.P. detachment.

Records available.—From May 1, 1912, to October 31, 1914. From July 5, 1910, to November 7, 1911, a station was maintained at W. S. Wilson's ranch, six miles above.

Gauge.—Vertical staff; zero of gauge maintained at 89.86 feet during 1912; 90.01 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet; located on the left bank 750 feet below the gauge.

Channel.—Composed of sand and slightly shifting.

Discharge measurements.—Made by wading.

Winter flow.—Station discontinued during winter season.

Diversions.—Water is diverted above this station for irrigation purposes by Mrs. L. A. Marshall, J. A. Gaff, Lindner Brothers, W. S. Wilson, and F. W. Henry.

Observer.—Mrs. Bertha Wilkes.

DISCHARGE MEASUREMENTS of Battle Creek at Wilkes' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 2.....	H. W. Rowley.....	26.0	30.80	1.35	2.25	42.00
May 26.....	do.....	11.5	6.90	0.85	1.66	5.80
June 20.....	do.....	9.5	3.60	1.21	1.44	4.40
July 10.....	do.....	7.0	2.10	0.81	1.34	1.71
Aug. 8.....	do.....	<i>a</i>			1.29	0.43
Sept. 1.....	do.....	<i>a</i>			1.36	2.10
Oct. 1.....	do.....	11.5 <i>b</i>	7.42	0.92	1.49	6.80
Nov. 2.....	do.....	26.0 <i>b</i>	16.75	1.17	1.78	19.60

a Weir measurement.*b* Measurement made below regular section.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Wilkes' Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			<i>b</i>		1.45	4.9
2.....			2.25	42.0	1.43	4.3
3.....			2.25	42.0	1.37	2.5
4.....			2.25	42.0	1.36	2.3
5.....			2.27	43.0	1.49	6.2
6.....	4.75	<i>a</i>	2.29	44.0	1.58	9.3
7.....	5.34		2.29	44.0	1.68	13.2
8.....	5.40		2.29	44.0	1.70	14.0
9.....	5.09		2.34	47.0	1.62	10.8
10.....	4.39		2.45	54.0	1.50	6.5
11.....	4.63		2.60	64.0	1.44	4.6
12.....	4.73		2.62	65.0	1.44	4.6
13.....	4.69		2.36	49.0	1.42	3.9
14.....	5.95	<i>a</i>	2.19	38.0	1.47	5.5
15.....	<i>b</i>		2.13	35.0	1.48	5.9
16.....			2.07	31.0	1.49	6.2
17.....			2.04	30.0	1.53	7.5
18.....			1.95	25.0	1.51	6.8
19.....			1.87	21.0	1.44	4.6
20.....			1.78	17.2	1.41	3.6
21.....			1.74	15.6	1.41	3.6
22.....			1.71	14.4	1.41	3.6
23.....			1.65	12.0	1.43	4.3
24.....			1.68	13.2	1.43	4.3
25.....			1.68	13.2	1.43	4.3
26.....			1.66	12.4	1.40	3.3
27.....			1.53	7.5	1.40	3.3
28.....			1.52	7.2	1.40	3.3
29.....			1.50	6.5	1.38	2.8
30.....			1.48	5.9	1.38	2.8
31.....			1.45	4.9		

a Ice conditions; not sufficient data to estimate discharge.*b* to *b* Gauge taken out by ice April 15; replaced May 2.

BATTLE CREEK DRAINAGE BASIN

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DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Wilkes' Ranch, for 1914. —Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.36	2.30	Dry.	Nil.	1.36	2.3	1.57	8.9
2.....	1.36	2.30	"	"	1.36	2.3	1.61	10.4
3.....	1.34	1.76	1.21	0.06	1.35	2.0	1.64	11.6
4.....	1.34	1.76	1.21	0.06	1.35	2.0	1.72	14.8
5.....	1.34	1.76	1.21	0.06	1.35	2.0	1.78	17.2
6.....	1.34	1.76	1.21	0.06	1.35	2.0	1.81	18.4
7.....	1.34	1.76	1.21	0.06	1.35	2.0	1.83	19.2
8.....	1.32	1.28	1.21	0.06	1.35	2.0	1.83	19.2
9.....	1.30	0.80	1.21	0.06	1.35	2.0	1.85	20.0
10.....	1.30	0.80	1.24	0.24	1.35	2.0	1.89	22.0
11.....	1.30	0.80	1.24	0.24	1.35	2.0	1.92	24.0
12.....	1.28	0.60	1.24	0.24	1.76	16.4	1.96	26.0
13.....	1.28	0.60	1.26	0.40	1.76	16.4	2.01	28.0
14.....	1.24	0.24	1.26	0.40	1.89	22.0	2.06	31.0
15.....	1.23	0.18	1.26	0.40	1.89	22.0	2.06	31.0
16.....	1.21	0.06	1.26	0.40	1.89	22.0	2.09	32.0
17.....	1.21	0.06	1.30	0.80	1.89	22.0	2.10	32.0
18.....	1.21	0.06	1.32	1.28	1.88	22.0	1.98	26.0
19.....	1.21	0.06	1.35	2.00	1.88	22.0	1.98	26.0
20.....	1.21	0.06	1.35	2.00	1.86	20.0	1.94	24.0
21.....	1.20	Nil.	1.37	2.50	1.86	20.0	1.94	24.0
22.....	1.20	"	1.37	2.50	1.86	20.0	1.88	22.0
23.....	Dry.	"	1.37	2.50	1.81	18.4	1.84	20.0
24.....	"	"	1.37	2.50	1.81	18.4	1.71	14.4
25.....	"	"	1.37	2.50	1.79	17.6	1.71	14.4
26.....	"	"	1.37	2.50	1.79	17.6	1.71	14.4
27.....	"	"	1.37	2.50	1.78	17.2	1.68	13.2
28.....	"	"	1.37	2.50	1.78	17.2	1.68	13.2
29.....	"	"	1.37	2.50	1.73	15.2	1.65	12.0
30.....	"	"	1.37	2.50	1.54	7.8	1.65	12.0
31.....	"	"	1.36	2.30			1.65	12.0

MONTHLY DISCHARGE of Battle Creek at Wilkes' Ranch, for 1914.

(Drainage area 310 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....				9.4090	0.4560	7,535 ₂
May (2-31).....	65.00	4.90	29.70	0.0958	0.1060	1,767
June.....	14.00	2.30	5.43	0.0175	0.0200	323
July.....	2.30	0.00	0.61	0.0020	0.0020	3
August.....	2.50	0.00	1.16	0.0037	0.0040	71
September.....	22.00	2.00	12.60	0.0406	0.0430	730
October.....	32.00	8.90	19.80	0.0640	0.0740	1,218
The period.....					0.7070	11,702

a Estimated from stations at Tenmile police detachment and at Nash's ranch.

GILCHRIST BROTHERS' DITCH FROM BATTLE CREEK.

Location.—On the SW. $\frac{1}{4}$ Sec. 11, Tp. 5, Rge. 27, W. 3rd Mer., at the intake of Gilchrist Brothers' ditch near Consul.

Records available.—For the irrigation season of 1914.

Gauge.—Vertical staff; the zero of the gauge has remained unchanged at 96.92 feet since establishment.

Bench-mark.—The top of a post at the lower end of the flume; assumed elevation, 100.00 feet.

Discharge measurements.—Made with a meter in the flume, or with a weir just below the flume.

Observer.—W. F. Gilchrist.

DISCHARGE MEASUREMENTS of Gilchrist Brothers' Ditch from Battle Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 26.....	H. W. Rowley.....	3.5	1.30	0.65	0.46	0.85
June 20.....	do.....	3.5	2.10	1.00	0.65	2.11
Oct. 1.....	do.....	3.0	1.75	0.70	0.54	1.23

DAILY GAUGE HEIGHT AND DISCHARGE of Gilchrist Brothers' Ditch from Battle Creek, for 1914.

DAY.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....											0.54	1.25
2.....											0.54	1.25
3.....											0.54	1.25
4.....											0.60	1.67
5.....											0.67	2.40
6.....											0.75b	3.20
7.....												
8.....			0.67a	2.40								
9.....			0.67	2.40								
10.....			0.58	1.52								
11.....			0.58	1.52								
12.....			0.79	3.70								
13.....			0.79	3.70								
14.....												
15.....												
16.....												
17.....			0.79	3.70								
18.....			0.91	5.00								
19.....			0.90	4.80								
20.....	a		0.62b	1.90					0.75a	3.20		
21.....	0.67	2.40							0.75	3.20		
22.....	0.67	2.40							0.71	2.80		
23.....	0.83b	4.20							0.67	2.40		
24.....									0.71b	2.80		
25.....	0.69a	2.60										
26.....	0.38	0.59										
27.....	0.33b	0.49							0.75a	3.20		
28.....									0.75	3.20		
29.....									0.75	3.20		
30.....									0.75	3.20		
31.....												

a Headgate opened.

b Headgate closed.

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MONTHLY DISCHARGE of Gilchrist Brothers' Ditch from Battle Creek, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May (21-27).....	4 20	0.49	2 10	.....	.....	25
June.....	5.00	1.52	3 10	.....	.....	61
September {20-24}.....	3 20	2.40	3 00	.....	.....	54
October {27-30}.....	3 20	1.25	1.84	.....	.....	22
October (1-6).....						
The period.....						162

RICHARDSON DITCH FROM BATTLE CREEK.

Location.—On the SE. $\frac{1}{4}$ Sec. 2, Tp. 5, Rge. 27, W. 3rd Mer., near Consul.

Records available.—October 14, 1911, to October 31, 1914.

Gauge.—Vertical staff; the zero of the gauge has been maintained at 99.79 feet since establishment.

Bench-mark.—The top of the quarter-mound stake; assumed elevation, 100.00 feet.

Channel.—Composed of clay loam and overgrown with grass.

Discharge measurements.—Made by wading or with a weir.

Observer.—L. E. Richardson.

Remarks.—This ditch was used for about 20 days in May, but insufficient data were obtained to estimate the discharge.

DISCHARGE MEASUREMENTS of Richardson Ditch from Battle Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 20.....	H. W. Rowley.....	.....	4 60	0.43	0.46	1.98

STIRLING AND NASH DITCH FROM BATTLE CREEK.

Location.—On the SE. $\frac{1}{4}$ Sec. 22, Tp. 3, Rge. 27, W. 3rd Mer., at R. J. Stirling's ranch, near Consul.

Records available.—This station was established July 11, 1911. The ditch was used from July 11 to August 17, 1911; from July 3 to August 20, 1912; and from June 28 to July 19, 1913. Sufficient discharge measurements were not made during 1911-13 to estimate the daily discharge; the first daily discharge records available are for 1914.

Gauge.—Vertical staff; the zero of the gauge has been maintained at 94.81 feet since establishment.

Bench-mark.—A wooden stake on the right bank; assumed elevation, 100.00 feet.

Channel.—Uniform and in good condition.

Discharge measurements.—Made by wading or with a weir.

Observer.—R. J. Stirling.

DISCHARGE MEASUREMENTS of Stirling and Nash Ditch from Battle Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 1.....	H. W. Rowley.....	9.0	6.30	1.08	1.39	6.80
May 26.....	do.....	9.5	7.25	1.04	1.51	7.50
June 19.....	do.....	9.5	6.93	0.91	1.49	6.30

DAILY GAUGE HEIGHT AND DISCHARGE of Stirling and Nash Ditch from Battle Creek, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.			1.42	6.10	1.48	7.10
2.			1.42	6.10	1.48	7.10
3.			1.52	7.80	1.48	7.10
4.			1.52	7.80	1.45	6.60
5.			1.52	7.80	1.45	6.60
6.			1.57	8.70	1.44	6.40
7.			1.60	9.20	1.44	6.40
8.			1.68	10.80	1.44	6.40
9.			1.72	11.40	1.44	6.40
10.			1.72	11.40	1.44	6.40
11.			1.72	11.40	1.40	5.80
12.			1.72	11.40	1.40	5.80
13.			1.72	11.40	1.36	5.30
14.			1.72	11.40	1.36	5.30
15.			1.72	11.40	1.36	5.30
16.			1.72	11.40	1.36	5.30
17.			1.70	11.20	1.30	4.50
18.			1.70	11.20	1.30	4.50
19.	1.12	2.80	1.70	11.20	1.25	4.00
20.	1.32	4.80	1.70	11.20	1.22	3.70
21.	1.32	4.80	1.68	10.80	1.22	3.70
22.	1.32	4.80	1.68	10.80	1.15	3.00
23.	1.32	4.80	1.68	10.80	1.10	2.60
24.	1.32	4.80	1.67	10.60	1.08	2.50
25.	1.32	4.80	1.67	10.60	1.08	2.50
26.	1.37	5.40	1.63	9.80	1.04	2.20
27.	1.35	5.10	1.54	8.10	0.96	1.66
28.	1.35	5.10	1.50	7.40	0.80	0.85
29.	1.37	5.40	1.50	7.40	0.59	0.28
30.	1.37	5.40	1.50	7.40	0.40	0.05
31.			1.50	7.40		

MONTHLY DISCHARGE of Stirling and Nash Ditch from Battle Creek, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
April (19-30).....	5.40	2.80	4.80	115
May.....	11.40	6.10	9.70	598
June.....	7.10	0.05	4.52	269
The period.....				982

BATTLE CREEK AT NASH'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 3, Tp. 3, Rge. 27, W. 3rd Mer., at E. R. Nash's ranch (Nash-lyn post office).

Records available.—May 11, 1910, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero of gauge 90.23 feet.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Slightly shifting.

Discharge measurements.—Made from cable car, by wading, or weir.

Winter flow.—Stations discontinued during winter season.

Diversions.—Water is diverted for irrigation by Jas. McKinnon, Jr., Mrs. S. J. Richardson, Gilchrist Brothers, Stirling and Nash, and L. E. Richardson, between this station and the station at Wilkes' ranch.

Observer.—E. R. Nash.

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DISCHARGE MEASUREMENTS of Battle Creek at Nash's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 23.	H. D. St. A. Smith	39.0	34.6	0.87	2.35	30.00
Mar. 24.	do	39.8	35.1	0.77	2.40	27.00
Mar. 28.	do	35.0	22.8	0.99	2.56	23.00
April 1.	do	55.0	110.0	0.98	4.08	108.00
April 2.	do	44.0	78.4	0.91	3.50	72.00
April 6.	do	36.0	43.2	1.36	1.87	59.00
April 10.	do	40.0	83.7	2.18	2.70	183.00
April 11.	do	39.0	65.4	1.34	2.35	88.00
May 1.	H. W. Rowley	30.0a	32.2	1.61	1.22	52.00
May 26.	do	12.0a	4.1	0.73	0.43	3.00
June 19.	do	6.5a	1.6	0.98	0.36	1.58
July 11.	do				0.14	Nil.
Aug. 8.	do				Dry.	"
Aug. 31.	do				"	"
Sept. 30.	do	24.0a	10.8	0.46	0.51	4.90
Oct. 31.	do	26.0a	12.3	0.80	0.61	9.80

a Measurements made at trail crossing, 400 feet below gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Nash's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			4.35	119	1.28	56.00	0.31	0.94
2.			3.63	78	1.19	49.00	0.31	0.94
3.			2.96	62	1.08	40.00	0.32	1.08
4.			2.68	65	0.99	33.00	0.33	1.22
5.			2.55	75	0.99	33.00	0.32	1.08
6.			2.55	93	1.03	36.00	0.33	1.22
7.			2.54	132	0.99	33.00	0.33	1.22
8.			2.55	145	1.09	41.00	0.34	1.36
9.			2.33	137	0.99	33.00	0.34	1.36
10.			2.56	169	0.99	33.00	0.30	0.80
11.			2.57	169	0.99	33.00	0.30	0.80
12.			2.15	132	1.37	64.00	0.30	0.80
13.			2.32	147	1.39	65.00	0.32	1.08
14.	2.65	36	2.86	195	1.18	48.00	0.34	1.36
15.	3.60	76	4.85	374	1.08	40.00	0.35	1.50
16.	3.53	72	5.21	407	1.06	39.00	0.34	1.36
17.	3.05	51	4.15	312	0.98	32.00	0.35	1.50
18.	2.98	48	3.53	256	0.85	23.00	0.35	1.50
19.	2.85	43	2.73	184	0.75	17.00	0.34	1.36
20.	3.45	68	2.28	143	0.70	14.00	0.33	1.22
21.	3.05	51	2.07	124	0.63	10.70	0.30	0.80
22.	2.80	41	2.00	118	0.57	8.30	0.25	0.50
23.	2.45	29	1.82	102	0.52	6.30	0.20	0.20
24.	2.40	27	1.69	90	0.47	4.60	0.23	0.38
25.	2.55	32	1.56	79	0.47	4.60	0.23	0.38
26.	2.68	37	1.58	80	0.44	3.70	0.23	0.38
27.	2.55	32	1.55	78	0.40	2.50	0.23	0.38
28.	2.56	33	1.59	74	0.30	0.80	0.24	0.44
29.	2.48	30	1.40	66	0.33	1.22	0.25	0.50
30.	2.44	28	1.29	57	0.32	1.08	0.35	1.50
31.	2.60	34			0.30	0.80		

DAILY GAUGE HEIGHT AND DISCHARGE of Battle Creek at Nash's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.35	1.50	Dry.	Nil.	Dry.	Nil.	0.53	6.7
2.....	0.34	1.36	"	"	"	"	0.55	7.5
3.....	0.34	1.36	"	"	"	"	0.45	4.0
4.....	0.34	1.36	"	"	"	"	0.49	5.2
5.....	0.30	0.80	"	"	"	"	0.46	4.3
6.....	0.20	0.20	"	"	"	"	0.76	17.6
7.....	0.20	0.20	"	"	"	"	0.51	21.0
8.....	0.15	Nil.	"	"	"	"	0.76	17.6
9.....	0.14	"	"	"	"	"	0.79	19.4
10.....	0.15	"	"	"	"	"	0.93	29.0
11.....	0.16	0.04	"	"	"	"	0.96	31.0
12.....	0.15	Nil.	"	"	"	"	1.05	38.0
13.....	0.15	"	"	"	"	"	0.96	31.0
14.....	0.11	"	"	"	"	"	0.86	24.0
15.....	0.09	"	"	"	"	"	0.86	24.0
16.....	0.06	"	"	"	"	"	0.76	17.6
17.....	0.04	"	"	"	"	"	0.76	17.6
18.....	0.03	"	"	"	"	"	0.97	32.0
19.....	Dry.	"	"	"	"	"	0.95	30.0
20.....	"	"	"	"	"	"	0.85	23.0
21.....	"	"	"	"	0.63	10.7	0.76	17.6
22.....	"	"	"	"	0.55	7.5	0.73	15.8
23.....	"	"	"	"	0.54	7.1	0.71	14.6
24.....	"	"	"	"	0.60	9.5	0.56	7.9
25.....	"	"	"	"	0.58	8.7	0.53	6.7
26.....	"	"	"	"	0.57	8.3	0.49	5.2
27.....	"	"	"	"	0.55	7.5	0.55	7.5
28.....	"	"	"	"	0.54	7.1	0.61	9.9
29.....	"	"	"	"	0.54	7.1	0.65	11.5
30.....	"	"	"	"	0.53	6.7	0.59	9.1
31.....	"	"	"	"	"	"	0.61	9.9

MONTHLY DISCHARGE of Battle Creek at Nash's Ranch, for 1914.

(Drainage area 536 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (14-31).....	76.00	27.00	43.00	0.0800	0.0530	1,523
April.....	407.00	57.00	142.00	0.2650	0.2960	8,450
May.....	65.00	0.80	26.00	0.0480	0.0560	1,599
June.....	1.50	0.20	0.97	0.0018	0.0020	58
July.....	1.50	0.00	0.22	0.0004	0.0004	14
August.....	0.00	0.00	0.00	Nil.	Nil.	Nil.
September.....	10.70	0.00	2.67	0.0050	0.0060	159
October.....	38.00	4.00	16.60	0.0311	0.0360	1,027
The period.....					0.4490	12,830

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Battle Creek drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Dis-charge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft.persec.</i>	<i>Sec.-ft.</i>
June 3.....	H. W. Rowley...	Fourmile Coulee	NW. 14-8-29-3.....	8.0	3.50	0.76	2.70
July 20.....	do ..	do ..	do ..				0.37
Aug. 7.....	do ..	Battle Creek ..	Sec. 28-5-28-3	8.5	3.22	0.70	2.20
Sept. 29.....	do ..	do ..	SW. 4-1-26-3.....				Nil.
Oct. 30.....	do ..	do ..	do ..	13.5	6.77	1.12	7.60
Sept. 30.....	do ..	do ..	Sec. 16-2-26-3.....				3.50

FRENCHMAN RIVER DRAINAGE BASIN.

General Description.

Frenchman River drains the greater portion of southwestern Saskatchewan. It rises in Cypress Lake in Township 6, Range 26, West of the 3rd Meridian, and follows a southeasterly course for some 150 miles, crossing into the United States in Range 10, West of the 3rd Meridian. It eventually finds its way into Milk River near Saco, Montana, and therefore forms a part of the general drainage basin of the Missouri.

Cypress Lake is on the southern slope of Cypress Hills at an elevation of about 3,155 feet above sea level. It occupies what is probably a portion of an abandoned watercourse or channel of an ancient river which joined Battle Creek to the Frenchman River. The water of the lake is fresh, and is supplied by a number of coulees and small streams which head in the hills to the north. The largest of these are Oxart and Sucker Creeks, both of which have a small, continuous flow.

During dry years Cypress Lake does not overflow, and the whole discharge of the Frenchman River is derived from Belanger, Davis and Fairwell Creeks and the North Branch. From Township 6, Range 23, West of the 3rd Meridian, where the North Branch joins the main stream, there is no appreciable supply to the river while in Canada. Mule Creek, which joins the river in Township 5, Range 17, West of the 3rd Meridian, and Snake Creek in Township 3, Range 13, West of the 3rd Meridian, however, have a small flow.

The country surrounding Cypress Lake is of rolling prairie, much broken by coulees. In many of these there is considerable tree growth, but for the most part the country is devoid of all vegetation other than grasses. All the streams in the upper section of the drainage basin, with the exception of the North Branch, rise on the plateau at the top of the hills. Flowing southward, they break through deep, well-wooded gorges before reaching the lower flats along the river. The North Branch, however, is in a deep valley throughout its entire length. Its feeders, like the western tributaries of the main stream, cut through from the bench to the valley in deep, well-wooded coulees. Below the mouth of the North Branch there is little tree growth. Here and there along the river may be found small growths of shrubs and maple, while up on the hillsides in some of the coulees there are small clumps of poplar covering an acre or so. Most of these coulees are rapidly becoming cleared by the settlers who are taking up the bench lands above the river valley. The benches are well covered with grasses, but the hills and sides of the valley are almost devoid of all vegetation. In the flats along the river, except where irrigated, the chief vegetation consists of sage brush and cactus.

When the Frenchman leaves the lake, it flows through a wide, flat valley as far as the mouth of Fairwell Creek. Most of this land is under proposed or constructed irrigation ditches, covering an area of about 393 acres. Below this point the valley becomes more broken, and narrows considerably, while the side hills become higher. Small portions of this bottom will, no doubt, be brought under irrigation, but as yet little has been done in that direction.

Below the junction of the North Branch the valley becomes rough and rugged, the sides being cut with buttes and deep coulees. Here numerous outcroppings of lignite may be seen, and also a deep seam of light-coloured clay and sand. This seam, which has been bleached almost a pure white, shows at many points along the river's entire course, and is one of the most conspicuous objects in this region. From its colour and nature the river receives its local name of the "Whitemud."

At East End, some miles lower down, the valley again widens out into flats. Here is located the largest irrigation project in the Cypress Hills district. Messrs. Strong and Day have a large dam in the river and a system of ditches and storage reservoirs, by which they irrigate 2,581 acres. Directly above this project there are two smaller schemes covering 200 acres. Just below, Messrs. Morrison Brothers have a dam and ditch which will irrigate 1,595 acres. Their ditch is carried across the river and continued by Messrs. Duncan and Watson, who irrigate 935 acres more.

Below the East End flat none of the flats, which occur at various points along the river, are irrigated as yet. A short distance below the mouth of Snake Creek the river enters bad lands, which continue into the United States.

The mean annual rainfall of this basin is not well established, but it is estimated that it would range from 12 to 16 inches, most of which falls in May, June and July. From November to April the streams are frozen over, and usually there is an abundant snowfall.

During 1914 a number of new stations were established on the lower branches of this stream, and also two on the main stream. These stations were established to obtain the run-off of this lower region and the total discharge of the stream in Canada.

The construction of the Weyburn-Lethbridge branch of the Canadian Pacific Railway through the upper part of the valley has opened up that part of the drainage basin, and the development has been the reason for one or two settlements coming into existence, the most important of which is East End.

OXARART AT WYLIE'S RANCH.

Location.—On the N.E. $\frac{1}{4}$ Sec. 20, Tp. 6, Rge. 27, W. 3rd Mer., at Joseph Wylie's ranch.

Records available.—From June 15, 1909, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 3,199.02 feet during 1909-10; 3,199.06 feet during 1911; 3,199.03 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark, located on the right bank at the station; elevation, 3,203.75 feet above mean sea level (Irrigation Surveys).

Channel.—Composed of coarse gravel and stone; liable to shift during flood, owing to great fall in stream.

Discharge measurements.—Made by wading or with a weir.

Winter flow.—Station discontinued during winter season.

Observer.—J. C. Wylie.

DISCHARGE MEASUREMENTS of Oxarart Creek at Wylie's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
March 28.....	H. R. Carscallen.....	6.2	3.03	1.50	0.75	0.45
April 10.....	do.....	11.4	6.26	1.14	1.18	7.10
May 2.....	H. W. Rowley.....	10.0	5.00	0.41	0.95	2.03
May 27.....	do.....	7.5	3.13	0.72	0.95	2.26
June 20.....	do.....	<i>a</i>			0.88	1.70
July 10.....	do.....	<i>a</i>			0.85	1.03
Aug. 7.....	do.....	<i>a</i>			0.86	0.63
Sept. 1.....	do.....	<i>a</i>			0.86	0.30
Oct. 1.....	do.....	<i>a</i>			0.87	0.42
Nov. 3.....	do.....	<i>a</i>			0.88	0.39

*a*Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Oxarart Creek at Wylie's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			0.75	0.50	1.02	3.40	0.98	2.60
2.....			0.75	0.45	0.98	2.60	0.98	2.60
3.....			0.75	0.35	0.95	2.00	0.98	2.60
4.....			1.12	7.25	0.95	2.00	0.98	2.60
5.....			1.62	19.50	0.95	2.00	0.98	2.60
6.....			1.42	14.25	0.95	2.00	0.98	2.60
7.....			1.05	4.80	1.10	5.10	0.98	2.60
8.....			1.05	4.50	1.20	7.60	0.98	2.60
9.....			1.06	4.50 ^a	1.20	7.60	0.98	2.60
10.....			0.96	2.20	1.00	3.00	0.98	2.60
11.....			1.02	3.40	1.00	3.00	0.98	2.60
12.....			1.02	3.40	0.99	2.80	0.98	2.60
13.....			1.52	15.60	0.99	2.80	0.98	2.60
14.....			1.51	15.25	0.98	2.60	0.98	2.60
15.....			1.53	15.80	0.98	2.60	0.95	2.00
16.....			1.48	14.60	0.98	2.60	0.95	2.00
17.....			1.39	12.40	0.98	2.60	0.95	2.00
18.....			1.31	10.40	0.98	2.60	0.95	2.00
19.....			1.33	10.80	0.98	2.60	0.95	2.00
20.....			1.28	9.60	0.98	2.60	0.95	2.00
21.....			1.28	9.60	0.98	2.60	0.95	2.00
22.....			1.22	8.10	0.98	2.60	0.95	2.00
23.....			1.23	8.40	0.98	2.60	0.95	2.00
24.....			1.20	7.60	0.98	2.60	0.95	2.00
25.....			1.13	5.80	0.98	2.60	0.95	2.00
26.....			1.07	4.40	0.98	2.60	0.95	2.00
27.....			1.03	3.60	0.98	2.60	0.95	2.00
28.....	0.75	0.45 ^a	1.03	3.60	0.98	2.60	0.95	2.00
29.....	0.76	0.65	1.03	3.60	0.98	2.60	0.95	2.00
30.....	0.75	0.55	1.03	3.60	0.98	2.60	0.95	2.00
31.....	0.75	0.55			0.98	2.60		

a to *b* Shifting conditions.

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DAILY GAUGE HEIGHT AND DISCHARGE of Oxart Creek at Wylie's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.95	2.00	0.82	0.33	0.86	0.30	0.88	0.42
2.....	0.93	1.75	0.82	0.33	0.86	0.30	0.88	0.43
3.....	0.93	1.75	0.84	0.52	0.86	0.30	0.88	0.45
4.....	0.90	1.30	0.84	0.52	0.86	0.31	0.88	0.46
5.....	0.90	1.30	0.83	0.41	0.86	0.31	0.88	0.48
6.....	0.90	1.30	0.84	0.52a	0.86	0.31	0.88	0.49
7.....	0.90	1.30	0.86	0.74	0.86	0.32	0.88	0.50
8.....	0.90	1.30	0.86	0.74	0.86	0.32	0.99	2.10
9.....	0.90	1.30	0.86	0.74	0.86	0.33	1.06	3.40
10.....	0.88	1.00	0.86	0.72	0.86	0.33	1.00	2.30
11.....	0.88	1.00	0.86	0.70	0.86	0.33	1.06	3.30
12.....	0.88	1.00	0.86	0.68	0.86	0.34	1.07	3.50
13.....	0.85	0.63	0.86	0.66	0.86	0.34	0.95	1.40
14.....	0.84	0.52	0.86	0.64	0.86	0.35	0.93	1.10
15.....	0.84	0.52	0.86	0.62	0.86	0.35	0.91	0.76
16.....	0.84	0.52	0.86	0.60	0.86	0.35	0.88	0.45
17.....	0.84	0.52	0.86	0.58	0.86	0.36	0.87	0.40
18.....	0.84	0.52	0.86	0.56	0.86	0.36	0.87	0.40
19.....	0.83	0.41	0.86	0.54	0.86	0.37	0.87	0.40
20.....	0.82	0.33	0.86	0.52	0.86	0.37	0.87	0.39
21.....	0.82	0.33	0.86	0.50	0.86	0.37	0.87	0.38
22.....	0.82	0.33	0.86	0.48	0.86	0.38	0.87	0.37
23.....	0.82	0.33	0.86	0.46	0.86	0.38	0.87	0.36
24.....	0.82	0.33	0.86	0.44	0.86	0.38	0.87	0.35
25.....	0.82	0.33	0.86	0.42	0.86	0.39	0.87	0.34
26.....	0.82	0.33	0.86	0.40	0.86	0.39	0.87	0.33
27.....	0.82	0.33	0.86	0.38	0.87	0.40	0.87	0.33
28.....	0.82	0.33	0.86	0.36	0.87	0.40	0.87	0.32
29.....	0.81	0.25	0.86	0.34	0.87	0.41	0.87	0.31
30.....	0.81	0.25	0.86	0.32	0.87	0.41	0.87	0.31
31.....	0.81	0.25	0.86	0.30	.....	.....	0.87	0.306

a to b Shifting conditions.

MONTHLY DISCHARGE of Oxart Creek at Wylie's Ranch, for 1914.

(Drainage area 77 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (28-31).....	0.65	0.45	0.55	0.0071	0.001	4
April.....	19.50	0.35	7.60	0.0987	0.110	452
May.....	7.60	2.00	3.00	0.0390	0.045	184
June.....	2.60	2.00	2.30	0.0290	0.033	135
July.....	2.00	0.25	0.76	0.0100	0.010	47
August.....	0.74	0.30	0.52	0.0070	0.008	32
September.....	0.41	0.30	0.35	0.0046	0.005	21
October.....	3.50	0.30	0.86	0.0110	0.013	53
The period.....	.....	.....	.....	.....	0.225	928

SUCKER CREEK AT WHITCOMB AND ZEIGLER'S RANCH.

Location.—On NW. $\frac{1}{4}$ Sec. 24, Tp. 6, Rge. 26, W. 3rd Mer.

Records available.—May 25, 1909, to October 31, 1914.

Gauge.—Vertical staff. The elevation of the zero of the gauge has been maintained at 3,191.11 feet since April, 1912; the elevation of the old gauge 200 feet below was 3,189.20 feet.

Bench-mark.—Permanent iron bench-mark; elevation, 3,196.25 feet above mean sea level (Irrigation Surveys).

Channel.—Permanent.

Discharge measurements.—Made by meter and weir in low stages.

Winter flow.—This station has not been maintained during the winter.

Observer.—Mrs. P. A. Zeigler and J. D. Gilchrist.

DISCHARGE MEASUREMENTS of Sucker Creek at Whitcomb and Zeigler's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
March 15.....	M. H. French.....	13.0	21.70	2.10	2.17	45.00
March 21.....	do.....	9.0	5.00	0.61	1.18	3.00
May 9.....	F. R. Steinberger.....	23.0	19.30	1.03	1.21	20.00
May 27.....	do.....	12.0	3.55	0.66	0.80	2.30
June 29.....	do.....	12.0	2.85	0.49	0.75	1.42
July 22.....	do.....				0.43	0.16 _a
Aug. 12.....	do.....				0.46	0.18 _a
Aug. 31.....	E. W. W. Hughes.....	7.5	1.70	0.68	0.64	1.16
Sept. 21.....	do.....	10.5	2.60	0.62	0.73	1.62
Oct. 18.....	do.....	10.5	3.00	0.70	0.79	2.10

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Sucker Creek at Whitcomb and Zeigler's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.10	1.7	0.90	4.8	0.77	1.92
2.....			1.35	7.7	0.90	4.8	0.78	2.10
3.....			1.45	11.4	0.88	4.2	0.75	1.60
4.....			1.56	16.2	0.88	4.2	0.75	1.60
5.....			1.80	28.0	0.89	4.5	0.80	2.40
6.....			1.89	32.0	0.89	4.5	0.89	4.50
7.....			2.09	42.0 _a	0.90	4.8	0.85	3.40
8.....			1.64	50.0	0.89	4.5	0.80	2.40
9.....			1.59	47.0	1.27	24.0	0.78	2.10
10.....			1.45	37.0	1.14	15.6	0.78	2.10
11.....			1.37	31.0	1.04	10.1	0.78	2.10
12.....			2.23	92.0	1.01	8.8	0.78	2.10
13.....			2.13	85.0	0.98	7.5	0.85	3.40
14.....			1.68	53.0	0.95	6.4	0.85	3.40
15.....	2.34	54.00 _a	1.38	32.0	0.90	4.8	0.80	2.40
16.....	2.17	45.00	1.07	11.6	0.87	4.0	0.79	2.20
17.....	2.12	43.00	1.37	31.0	0.87	4.0	0.78	2.10
18.....	2.12	43.00	1.07	11.6	0.86	3.7	0.76	1.76
19.....	2.12	43.00	1.05	10.6	0.86	3.7	0.74	1.52
20.....	1.18	3.10	1.05	10.6	0.85	3.4	0.85	3.40
21.....	1.18	3.10	1.04	10.1	0.84	3.2	0.85	3.40
22.....	0.86	Nil.	1.06	11.2	0.81	2.6	0.78	2.10
23.....		" <i>b</i>	1.03c	9.7	0.79	2.2	0.76	1.76
24.....		"	1.00c	8.3	0.84	3.2	0.75	1.60
25.....		"	0.97	7.2	0.80	2.4	0.85	3.40
26.....		"	0.95	6.4	0.78	2.1	0.80	2.40
27.....		"	0.92	5.4	0.80	2.4	0.78	2.10
28.....		"	0.91	5.1	0.80	2.4	0.75	1.60
29.....		" <i>b</i>	0.90	4.8	0.79	2.2	0.75	1.60
30.....	0.90	0.05	0.90	4.8	0.79	2.2	0.74	1.52
31.....	0.93	0.10			0.78	2.1		

a to *a* Ice conditions.

b to *b* Channel frozen over.

c Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Sucker Creek at Whitcomb and Zeigler's Ranch,
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.73	1.44	0.43	0.13	0.60	0.50	0.72	1.36
2.....	0.69	1.12	0.43	0.13	0.60	0.50	0.76	1.76
3.....	0.67	0.96	0.43	0.13	0.60	0.50	0.79	2.20
4.....	0.65	0.80	0.43	0.13	0.60	0.50	0.98	7.50
5.....	0.64	0.74	0.43	0.13	0.59	0.47	0.97	7.20
6.....	0.64	0.74	0.44	0.14	0.58	0.44	0.84	3.20
7.....	0.54	0.32	0.45	0.15	0.60	0.50	0.87	4.00
8.....	0.47	0.17	0.45	0.15	0.61	0.56	0.98	7.50
9.....	0.47	0.17	0.46	0.16	0.60	0.50	0.90	4.80
10.....	0.46	0.16	0.46	0.16	0.59	0.47	0.88	4.20
11.....	0.46	0.16	0.46	0.16	0.60	0.50	0.86	3.70
12.....	0.56	0.38	0.46	0.16	0.69	1.12	0.80	2.40
13.....	0.49	0.19	0.46	0.16	0.98	7.50	0.80	2.40
14.....	0.47	0.17	0.46	0.16	0.79	2.20	0.80	2.40
15.....	0.56	0.38	0.46	0.16	0.67	0.96	0.80	2.40
16.....	0.46	0.16	0.46	0.16	0.65	0.80	0.80	2.40
17.....	0.57	0.41	0.48	0.18	0.65	0.80	0.80	2.40
18.....	0.48	0.18	0.50	0.20	0.66	0.88	0.80	2.40
19.....	0.49	0.19	0.56	0.38	0.71	1.28	0.78	2.10
20.....	0.47	0.17	0.54	0.32	0.71	1.28	0.77	1.92
21.....	0.43	0.13	0.54	0.32	0.71	1.28	0.78	2.10
22.....	0.43	0.13	0.54	0.32	0.70	1.20	0.77	1.92
23.....	0.42	0.12	0.57	0.41	0.71	1.28	0.77	1.92
24.....	0.42	0.12	0.68	1.04	0.71	1.28	0.77	1.92
25.....	0.43	0.13	0.68	1.04	0.71	1.28	0.77	1.92
26.....	0.43	0.13	0.67	0.96	0.71	1.28	0.77	1.92
27.....	0.44	0.14	0.67	0.96	0.71	1.28	0.77	1.92
28.....	0.42	0.12	0.64	0.74	0.71	1.28	0.79	2.20
29.....	0.43	0.13	0.61	0.56	0.71	1.28	0.82	2.80
30.....	0.42	0.12	0.61	0.56	0.71	1.28	0.82	2.80
31.....	0.42	0.12	0.60	0.50	.....	.....	0.82	2.80

MONTHLY DISCHARGE of Sucker Creek at Whitcomb and Zeigler's Ranch, for 1914.

(Drainage area 30 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (15-31).....	54.00	0.00	13.80	0.460	0.29	464
April.....	92.00	1.70	24.00	0.793	0.88	1,416
May.....	24.00	2.10	5.10	0.171	0.20	316
June.....	4.50	1.52	2.30	0.078	0.09	139
July.....	1.44	0.12	0.36	0.011	0.01	21
August.....	1.04	0.13	0.35	0.012	0.01	22
September.....	7.50	0.44	1.17	0.039	0.04	70
October.....	7.50	1.36	3.00	0.099	0.11	183
The period.....	.....	.....	.....	.....	1.63	2,631

LONEPINE CREEK AT HEWITT'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 27, Tp. 7, Rge. 26, W. 3rd Mer.

Records available.—April 1, 1910, to October 31, 1914.

Gauge.—Vertical staff. The elevation of the zero of the gauge has been maintained at 93 35 feet since establishment. On June 28, 1913, a permanent weir was established, and since that date records of the discharge have been made by this means. The elevation of the zero of the gauge and crest of the weir is 96.34 feet.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter in flood stages, and by permanent weir at other stages.

Diversions.—Messrs. A. P. McDonald and S.W. Hewitt divert water for irrigation purposes above the gauge.

Observer.—S. W. Hewitt.

DISCHARGE MEASUREMENTS of Lonepine Creek at Hewitt's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Fl. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 11.	F. R. Steinberger				0.58	1.57
May 28.	do				0.40	0.99
June 23.	do				0.22	0.42
June 30.	do				0.25	0.50
Aug. 12.	do				0.22	0.42
Aug. 31.	E. W. W. Hughes				0.21	0.39
Sept. 21.	do				0.32	0.72

DAILY GAUGE HEIGHT AND DISCHARGE of Lonepine Creek at Hewitt's Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			0.43	1.10	0.29a	0.62
2.			0.42a	1.06	0.30	0.65
3.			0.40a	0.99	0.30a	0.65
4.			0.39	0.96	0.30a	0.65
5.			0.42	1.06	0.30a	0.65
6.			0.39	0.96	0.30	0.65
7.			0.39	0.96	0.27	0.56
8.			0.48	1.28	0.29	0.62
9.			0.48a	1.28	0.28	0.59
10.			0.49	1.31	0.28a	0.59
11.			0.58	1.67	0.29a	0.62
12.			0.58	1.67	0.29a	0.62
13.			0.58	1.67	0.30a	0.65
14.	0.99	6.70	0.58	1.67	0.30	0.65
15.	0.97a	3.40	0.58	1.67	0.28a	0.59
16.	0.95	3.20	0.57	1.63	0.26a	0.53
17.	1.27a	4.30	0.57	1.63	0.24a	0.47
18.	1.59	6.10	0.48	1.28	0.22a	0.42
19.	0.95	3.20	0.48a	1.28	0.20	0.36
20.	0.96a	3.30	0.48a	1.28	0.20	0.36
21.	0.96	3.30	0.48	1.28	0.27	0.56
22.	0.96	3.30	0.48a	1.28	0.26	0.53
23.	0.96	3.30	0.47a	1.24	0.20	0.36
24.	0.72a	2.20	0.47	1.24	0.21a	0.39
25.	0.74	1.24	0.40	0.99	0.22a	0.42
26.	0.46	1.21	0.35	0.82	0.23a	0.44
27.	0.46	1.21	0.34a	0.79	0.24a	0.47
28.	0.45	1.17	0.32a	0.72	0.24	0.47
29.	0.46	1.21	0.30a	0.65	0.23	0.44
30.	0.45	1.17	0.29a	0.62	0.25	0.50
31.			0.28	0.59		

a Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Lonepine Creek at Hewitt's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.24a	0.47	0.18a	0.31	0.22	0.42	0.25a	0.50
2.....	0.23a	0.44	0.18	0.31	0.22a	0.42	0.25a	0.50
3.....	0.22a	0.42	0.18	0.31	0.23	0.44	0.25a	0.50
4.....	0.21a	0.39	0.18	0.31	0.22	0.42	0.40	0.99
5.....	0.20	0.36	0.19a	0.34	0.24a	0.47	0.37	0.89
6.....	0.20	0.36	0.20a	0.36	0.26	0.53	0.38	0.92
7.....	0.20	0.36	0.21a	0.39	0.26a	0.53	0.40a	0.99
8.....	0.21a	0.39	0.22	0.42	0.26a	0.53	0.43a	1.10
9.....	0.23a	0.44	0.27	0.56	0.26a	0.53	0.46a	1.21
10.....	0.25a	0.50	0.25a	0.50	0.26a	0.53	0.48a	1.28
11.....	0.27a	0.56	0.23a	0.44	0.26a	0.53	0.50	1.35
12.....	0.28	0.59	0.22	0.42	0.26a	0.53	0.45	1.17
13.....	0.29	0.62	0.20a	0.36	0.60	1.75	0.40	0.99
14.....	0.30	0.65	0.19	0.34	0.51	1.39	0.40a	0.99
15.....	0.28a	0.59	0.19a	0.34	0.40	0.99	0.40a	0.99
16.....	0.26a	0.53	0.19	0.34	0.40a	0.99	0.40a	0.99
17.....	0.24a	0.47	0.19	0.34	0.40a	0.99	0.40a	0.99
18.....	0.22a	0.42	0.19a	0.34	0.40a	0.99	0.40	0.99
19.....	0.20	0.36	0.34	0.79	0.40a	0.99	0.35	0.82
20.....	0.22	0.42	0.30a	0.65	0.40	0.99	0.32	0.72
21.....	0.22a	0.42	0.26a	0.53	0.32	0.72	0.32a	0.72
22.....	0.22a	0.42	0.22a	0.42	0.31a	0.68	0.32a	0.72
23.....	0.22	0.42	0.19	0.34	0.30a	0.65	0.32a	0.72
24.....	0.21a	0.39	0.35	0.82	0.30	0.65	0.32a	0.72
25.....	0.20a	0.36	0.25	0.50	0.28a	0.59	0.33	0.75
26.....	0.20	0.36	0.25a	0.50	0.27a	0.56	0.33	0.75
27.....	0.20	0.36	0.24a	0.47	0.25	0.50	0.33	0.75
28.....	0.20	0.36	0.24a	0.47	0.25	0.50	0.33a	0.75
29.....	0.20a	0.36	0.23a	0.44	0.25	0.50	0.33a	0.75
30.....	0.19a	0.34	0.22	0.42	0.25a	0.50	0.33a	0.75
31.....	0.19a	0.34	0.21	0.39	.....	.....	0.33a	0.75

a Gauge height interpolated.

MONTHLY DISCHARGE of Lonepine Creek at Hewitt's Ranch, for 1914.

(Drainage area 8 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (13-30).....	6.70	1.17	2.90	0.370	0.25	105
May.....	1.67	0.59	1.18	0.147	0.17	73
June.....	0.65	0.36	0.54	0.067	0.08	32
July.....	0.65	0.34	0.44	0.054	0.06	27
August.....	0.79	0.31	0.44	0.054	0.06	27
September.....	1.75	0.42	0.69	0.087	0.10	41
October.....	1.35	0.50	0.87	0.109	0.13	54
The period.....					0.85	359

BELANGER CREEK AT OAKES' RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 30, Tp. 6, Rge. 25, W. 3rd Mer.

Records available.—April 1, 1912, to April 11, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 3,164.10 feet since establishment.

Bench-mark.—Permanent iron bench-mark; elevation, 3,168.37 feet above mean sea level (Irrigation Surveys).

Channel.—Slightly shifting.

Discharge measurements.—Made with meter.

Winter flow.—This station is not maintained during the winter.

Diversions.—Messrs. R. G. Williamson, T. A. Drury, J. H. G. Bettington, and Dixon and Stuart divert water for irrigation purposes above the gauge.

Observer.—E. C. R. Harris.

DISCHARGE MEASUREMENTS of Belanger Creek at Oakes' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 16.....	M. H. French.....	5.5	39.00	1.80	2.47	70.00 ^a
Mar. 21.....	do.....	5.5	3.70	1.40	1.01	5.20
May 9.....	F. R. Steinberger.....	10.3	11.30	1.31	0.52	14.80
May 27.....	do.....	10.0	9.25	0.78	0.40	7.20
June 29.....	do.....	10.0	8.93	0.51	0.28	4.30
July 22.....	do.....	7.4	3.26	0.48	0.12	1.56
Aug. 12.....	do.....	6.0	2.50	0.53	0.13	1.32
Aug. 31.....	E. W. W. Hughes.....	12.5	2.55	0.64	0.19	1.62
Sept. 21.....	do.....	12.8	3.38	0.83	0.38 ^b	2.80
Oct. 18.....	do.....	13.6	4.11	0.94	0.30 ^b	3.90

^a Discharge approximated.

^b Gauge heights affected by beaver dams.

DAILY GAUGE HEIGHT AND DISCHARGE of Belanger Creek at Oakes' Ranch, for 1914.

DAY.	March.		April.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			0.69	0.60 ^a
2.....				
3.....			2.72	138.00
4.....			2.62	133.00
5.....			2.60	132.00
6.....				
7.....			2.57	130.00
8.....			2.22	110.00
9.....				
10.....				
11.....			1.26	56.00
12.....			^b	
13.....				
14.....	2.43	68.00 ^a		
15.....	2.73	82.00		
16.....				
17.....				
18.....	1.43	24.00		
19.....				
20.....				
21.....	1.01	5.20		
22.....				
23.....	0.59	0.30		
24.....				
25.....	0.52	0.05		
26.....	0.44	Nil.		
27.....				
28.....	0.42	Nil.		
29.....				
30.....				
31.....				

^a to ^a Ice conditions.

^b No observer obtainable after April 11.

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DAVIS CREEK AT DRURY'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 29, Tp. 6, Rge. 25, W. 3rd Mer.

Records available.—May 24, 1909, to August 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 3,176.79 feet since establishment.

Bench-mark.—Permanent iron bench-mark; elevation, 3,183.06 feet above mean sea level (Irrigation Surveys).

Channel.—Permanent.

Discharge measurements.—Made with meter and weir at low stages.

Winter flow.—This station is not maintained during the winter.

Diversions.—Mr. B. C. Wright diverts water for irrigation purposes above the gauge.

Observer.—A. Betteley.

DISCHARGE MEASUREMENTS of Davis Creek at Drury's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height. ^a	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Mar. 16	M. H. French	20.5	19.90	2.90	1.42	58.00
Mar. 20	do	10.0	3.50	0.26	0.67	0.93
April 8	do	21.0	25.50	2.27	1.38	58.00
April 22	do	14.0	6.48	1.56	0.68	10.10
May 9	F. R. Steinberger	22.1	26.20	0.98	0.93	26.00
May 27	do	14.0	47.50	0.60	0.42	2.80
June 29	do	13.3	3.70	0.41	0.43	1.53
July 22	do	12.5	3.28	0.34	0.34	1.12
Aug. 12	do				0.24	0.57 ^a
Aug. 31	E. W. W. Hughes				0.16	0.06 ^a
Sept. 21	do					Nil.
Oct. 18	do	14.0	4.40	0.52	0.41	2.30

^a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Davis Creek, at Drury's Ranch, for 1914.

DAY.	March.		April.		May.		June.		July.		August.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1			0.87	21.0	0.55	5.00	0.39	1.90	0.42	2.30		
2			0.91	23.0	0.53	4.50			0.42 ^b	2.30		
3			1.04	32.0	0.52	4.20			0.41 ^b	2.20		
4			1.07	35.0	0.54	4.80	0.38	1.80	0.40	2.00		
5			1.91 ^b	96.0	0.54	4.80	0.38	1.80	0.39	1.90		
6			2.73	154.0	0.55	5.00			0.39	1.90		
7			2.31	128.0	0.65 ^b	9.00	0.38	1.80	0.39	1.90		
8			2.23	121.0 ^a	0.76	14.60			0.40	2.00		
9			1.25	48.0	0.93	25.00			0.39	1.90		
10	0.58	5.0 ^a	1.25	48.0	0.91	24.00			0.39	1.90		
11	0.59	5.3	1.10	37.0	0.85	20.00	0.37	1.70	0.38	1.80		
12	0.59	5.3	1.57	72.0	0.78 ^b	15.80			0.38	1.80		
13	0.61	6.0	1.92	98.0	0.72	12.50			0.38	1.80		
14	2.67	150.0	1.68	80.0	0.67	10.00			0.39 ^b	1.90		
15	1.78	84.0	1.39	58.0	0.63	8.20			0.39	1.90		
16	1.59	70.0	1.49	66.0	0.61 ^b	7.40			0.43	2.40		
17	1.19	42.0	1.08	36.0	0.59	6.60			0.43	2.40		
18	0.84	17.2	0.95	26.0	0.56 ^b	5.40			0.43 ^b	2.40		
19	0.90	20.0	0.74	13.5	0.53	4.50			0.43	2.40		
20	0.79	4.2	0.73	13.0	0.51 ^b	4.00			0.43	2.40		
21	0.57	1.9	0.75	14.0	0.50	3.80			0.43	2.40		
22	0.62	4.2	0.70	11.5	0.49 ^b	3.60			0.34	1.40	0.20	0.25
23	0.81	13.2	0.74	13.5	0.48 ^b	3.40			0.35	1.50	0.20	0.25
24	0.71	9.4	0.72	12.5	0.46 ^b	3.00			0.34	1.40	0.21	0.32
25	0.85	17.6	0.66	9.5	0.45 ^b				0.33	1.30	0.20	0.25
26	0.61	6.4	0.65	9.0	0.44 ^b	2.80			0.34	1.40	0.19	0.20
27	0.60	6.2	0.63 ^b	8.2	0.42	2.30			0.35	1.50	0.19	0.20
28	0.56	5.0	0.61	7.4	0.42	2.30			0.33	1.30	0.18	0.15
29	0.56	5.2	0.61	7.4	0.40	2.00	0.43	2.40	0.32	1.20	0.18	0.15
30	0.59	6.2	0.59	6.6	0.40 ^b	2.00	0.43	2.40	0.32 ^b	1.20	0.18	0.15
31	0.59	6.4			0.39	1.90			0.32 ^b	1.20	0.16	0.05

^a to ^a Ice conditions.

^b Gauge height interpolated.

MONTHLY DISCHARGE of Davis Creek at Drury's Ranch, for 1914.

(Drainage area 45 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (10-31).....	150.00	1.90	22.00	0.500	0.410	973
April.....	154.00	6.60	44.00	0.970	1.080	2,588
May.....	25.00	1.90	7.20	0.160	0.180	446
June..... ^a	2.40	1.70	1.97	0.044	0.011	27
July.....	2.40	1.20	1.85	0.041	0.047	114
August (22-31).....	0.25	0.05	0.20	0.004	0.001	4
September..... ^b						
October..... ^b						
The period					1.729	4,152

^a Discharges computed on June 1, 4, 5, 7, 11, 29 and 30 only.^b No observer obtainable.

FAIRWELL CREEK AT DRURY'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 30, Tp. 6, Rge. 24, W. 3rd Mer.*Records available.*—June 10, 1909, to October 31, 1914.*Gauge.*—Vertical staff; the elevation of the zero of the gauge has been maintained at 95.13 feet since establishment.*Bench-mark.*—Permanent iron bench-mark; assumed elevation, 100.00 feet.*Channel.*—Slightly shifting, owing to beaver dams.*Discharge measurements.*—Made with meter and weir at low periods.*Diversions.*—Messrs. Armstrong and Sons, Kearney Bros., and J. Ingram divert water for irrigation purposes above the gauge.*Observer.*—A. J. Hart.

DISCHARGE MEASUREMENTS of Fairwell Creek at Drury's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 16.....	M. H. French	87.0	131.00	1.70	3.68	223.00
Mar. 20.....	do	16.0	20.20	0.80	2.65	16.10
April 7.....	do	90.0	115.00	1.67	3.61	192.00
April 9.....	do	62.0	65.00	1.24	3.12	80.00
April 22.....	do	19.3	19.50	1.35	2.72	26.00
May 8.....	F. R. Steinberger.....	24.2	30.20	0.79	2.73	24.00
May 26.....	do	14.0	10.20	0.92	2.48	9.40
June 27.....	do	11.3	8.71	0.49	2.41	4.30
July 21.....	do	12.0	3.80	0.67	2.34	2.60
Aug. 11.....	do	11.5	3.53	0.55	2.30	1.94
Aug. 29.....	E. W. W. Hughes.....	9.7	2.56	0.38	2.34	0.98
Sept. 21.....	do				2.28	0.50 ^a

^a Weir measurement.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Fairwell Creek at Drury's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.94	50.0	2.59	14.3	2.46 ^a	6.5
2.....			3.25	107.0	2.59	14.3	2.46 ^a	6.5
3.....			3.51	172.0	2.59	14.3	2.47 ^a	7.0
4.....			3.61	198.0	2.59	14.3	2.47 ^a	7.0
5.....			3.94	287.0	2.62	16.4	2.47 ^a	7.0
6.....			4.00	303.0	2.62	16.4	2.48 ^a	7.5
7.....			3.76	238.0	2.64	17.8	2.48	7.5
8.....	2.27	0.7	3.41	146.0	2.72	24.0	2.48 ^a	7.5
9.....	2.26	0.6	3.11	78.0	2.75	27.0	2.48	7.5
10.....	2.28	0.8	3.06	69.0	2.77	29.0	2.50	8.5
11.....	2.28	0.8	3.26	109.0	2.75	27.0	2.47	7.0
12.....	2.28	0.8	4.02	308.0	2.66	19.3	2.46	6.5
13.....	2.29	0.9	3.86	265.0	2.64	17.8	2.45	6.0
14.....	2.59	14.3	3.45	156.0	2.60	15.0	2.46	6.5
15.....	3.65	208.0	3.29	116.0	2.60	15.0	2.48	7.5
16.....	3.69	219.0	3.20	96.0	2.58	13.6	2.46	6.5
17.....	3.28	114.0	3.05	67.0	2.57	12.9	2.46	6.5
18.....	2.95	51.0	2.90	44.0	2.57	12.9	2.46	6.5
19.....	2.81	33.0	2.79	31.0	2.57	12.9	2.46	6.5
20.....	2.69	22.0	2.82	34.0	2.55	11.5	2.46	6.5
21.....	2.59	14.3	2.77	29.0	2.55	11.5	2.48	7.5
22.....	2.52	9.7	2.71	23.0	2.54	10.9	2.48	7.5
23.....	2.55	11.5	2.71	23.0	2.54	10.9	2.47	7.0
24.....	2.52	9.7	2.69	22.0	2.55	11.5	2.47	7.0
25.....	2.32	1.4	2.68	21.0	2.55	11.5	2.46	6.5
26.....	2.47	7.0	2.63	17.1	2.48	7.5	2.45	6.0
27.....	2.61	15.7	2.62	16.4	2.46	6.5	2.42	4.8
28.....	2.65	18.5	2.59	14.3	2.46	6.5	2.42	4.8
29.....	2.69	22.0	2.60	15.0	2.45	6.0	2.42	4.8
30.....	2.70	22.5	2.59	14.3	2.45 ^a	6.0	2.42	4.8
31.....	2.70	22.5			2.45 ^a	6.0		

^a Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Fairwell Creek at Drury's Ranch, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2 40	4 00	2 33	1 60	2 33	1 60	2 30	1 00
2.....	2 40	4 00	2 32	1 40	2 31	1 20	2 29	0 90
3.....	2 40	4 00	2 32	1 40	2 30	1 00	2 34	1 80
4.....	2 40	4 00	2 30	1 00	2 30	1 00	2 32	1 40
5.....	2 40	4 00	2 30	1 00	2 30	1 00	2 36	2 40
6.....	2 40	4 00	2 30	1 00	2 30	1 00	2 34	1 80
7.....	2 40	4 00	2 30	1 00	2 30	1 00	2 30	1 00
8.....	2 38	3 20	2 30	1 00	2 30	1 00	2 30	1 00
9.....	2 38	3 20	2 30	1 00	2 30	1 00	2 30	1 00
10.....	2 38	3 20	2 30	1 00	2 30	1 00	2 30	1 00
11.....	2 38	3 20	2 30	1 00	2 29	0 90	2 30	1 00
12.....	2 36	2 40	2 29	0 90	2 30	1 00	2 30	1 00
13.....	2 36	2 40	2 29	0 90	2 40	4 00	2 30	1 00
14.....	2 36	2 40	2 29	0 90	2 36	2 40	2 30	1 00
15.....	2 36	2 40	2 29	0 90	2 34	1 80	2 30	1 00
16.....	2 35	2 00	2 30	1 00	2 34	1 80	2 30	1 00
17.....	2 35	2 00	2 30	1 00	2 32	1 40	2 30	1 00
18.....	2 35	2 00	2 30	1 00	2 32	1 40	2 28	0 80
19.....	2 35	2 00	2 30	1 00	2 30	1 00	2 30	1 00
20.....	2 35	2 00	2 30	1 00	2 28	0 80	2 30	1 00
21.....	2 34	1 80	2 30	1 00	2 28	0 80	2 30	1 00
22.....	2 34	1 80	2 30	1 00	2 27	0 70	2 30	1 00
23.....	2 34	1 80	2 30	1 00	2 27	0 70	2 30	1 00
24.....	2 34	1 80	2 32	1 40	2 27	0 70	2 30	1 00
25.....	2 34	1 80	2 34	1 80	2 27	0 70	2 30	1 00
26.....	2 34	1 80	2 34	1 80	2 27	0 70	2 29	0 90
27.....	2 34	1 80	2 33	1 60	2 30	1 00	2 29	0 90
28.....	2 33	1 60	2 33	1 60	2 36	2 40	2 29	0 90
29.....	2 34	1 80	2 34	1 80	2 28	0 80	2 29	0 90
30.....	2 33	1 60	2 34	1 80	2 29	0 90	2 29	0 90
31.....	2 33	1 60	2 34	1 80	.....	.....	2 29	0 90

MONTHLY DISCHARGE of Fairwell Creek at Drury's Ranch, for 1914.

(Drainage area 125 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (8-31).....	219 00	0 60	34 00	0 273	0 244	1,625
April.....	308 00	14 30	102 00	0 818	0 913	6,070
May.....	29 00	6 00	14 20	0 113	0 130	873
June.....	8 50	4 80	6 60	0 053	0 059	395
July.....	4 00	1 60	2 60	0 020	0 023	158
August.....	1 80	0 90	1 21	0 010	0 011	74
September.....	4 00	0 70	1 22	0 010	0 011	73
October.....	2 40	0 80	1 08	0 008	0 009	66
The period.....	1 400	9,334

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FRENCHMAN RIVER AT GORDON'S RANCH.

Location.—On NW. $\frac{1}{4}$ Sec. 16, Tp. 6, Rge. 24, W. 3rd Mer., at R. N. S. Gordon's ranch near Ravenscrag.

Records available.—May 17, 1913, to October 31, 1914.

Gauge.—Chain gauge; the elevation of the zero of the gauge has been 85.96 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Shifting, caused by sliding banks.

Discharge measurements.—Made by wading or from cable.

Winter flow.—Station not maintained during winter.

Observer.—J. Plant and P. Harradine.

DISCHARGE MEASUREMENTS OF Frenchman River at Gordon's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 17.....	M. H. French.....	129.0	137.00	1.58	6.01	214.00 ^a
Mar. 23.....	do.....	10.6	9.75	2.18	3.33	21.00 ^a
April 9.....	do.....	48.0	70.40	3.05	4.56	247.00 ^a
April 21.....	do.....	28.0	29.10	2.01	2.63	58.00
May 8.....	F. R. Steinberger.....	33.0	36.80	1.18	2.33	44.00
May 26.....	do.....	30.0	22.80	0.87	2.00	19.90
June 27.....	do.....	31.5	18.30	0.70	1.89	12.80
July 2.....	do.....	21.5	10.50	0.39	2.02 ^b	4.08
Aug. 8.....	do.....	16.5	7.75	0.22	2.27 ^b	1.69
Aug. 29.....	E. W. W. Hughes.....	16.5	7.42	0.07	2.44 ^b	0.51

^a Ice conditions.

^b Gauge height affected by beaver dam.

DAILY GAUGE HEIGHT AND DISCHARGE OF Frenchman River at Gordon's Ranch, for 1914.

DAY.	March.		April.		May.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....					2.32	39
2.....					2.29	37
3.....						
4.....						
5.....						
6.....			8.51	720		
7.....			7.51	601		
8.....					2.32	39
9.....			4.66	247		
10.....			3.72	156	2.57	57
11.....			3.61	145	2.50	52
12.....			5.41	349	2.40	45
13.....					2.24	34
14.....	3.10	98	5.74	389	2.24	34
15.....	7.09	551	5.11	313	2.27	36
16.....	6.01	421			2.22	32
17.....	5.89	214			2.20	31
18.....	4.87	286	3.18	105	2.14	27
19.....	4.67	260	2.85	78	2.19	30
20.....			2.69	65	2.14	27
21.....			2.63	61	2.14	27
22.....			2.52	53		
23.....	3.33	21	2.48	51		
24.....			2.47	50		
25.....			2.47	50		
26.....			2.57	57	2.00	19
27.....			2.47	50		
28.....			2.46	49		
29.....			2.45	49		
30.....			2.36	42		
31.....						

NOTE.—Observations of gauge height periodically taken after May 31 of no value on account of beaver dam below the station.

MONTHLY DISCHARGE of Frenchman River at Gordon's Ranch, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March.....	551	21	264			
April.....	720	42	175			
May.....	57	19	35			
The period.....						

NOTE.—Repeated hiatus in gauge heights prevents monthly computations.

FRENCHMAN RIVER AT RAVENSERAG.

Location.—On the NW. $\frac{1}{4}$ Sec. 19, Tp. 6, Rge. 23, W. 3rd Mer.

Records available.—One measurement—October 17, 1914.

Gauge.—Vertical staff, fastened to pile in the fourth bent from west end of Canadian Pacific Railway bridge; the elevation of the zero of the gauge has been 89.73 feet since establishment.

Bench-mark.—Six-foot spike driven in the second telegraph pole on the west side of the river; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made with meter.

Observer.—None.

DISCHARGE MEASUREMENTS of Frenchman River at Ravenserag, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Oct 17	E. W. W. Hughes	48 0	17 3	0.56	1.14	9 70

ROSE CREEK NEAR EAST END.

Location.—On the NE. $\frac{1}{4}$ Sec. 26, Tp. 7, Rge. 22, W. 3rd Mer., at B. Rose's ranch.

Records available.—May 1, 1911, to October 31, 1914.

Gauge.—Vertical staff; elevation of the zero of the gauge has been maintained at 91.09 feet since establishment. On June 16, 1913, a permanent weir was established at this station, and records since that date have been kept on the gauge above the weir; the elevation of the crest of the weir and zero of the rod is 92.98 feet.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with permanent weir.

Diversions.—Mr. B. E. Rose diverts water for irrigation purposes above the station.

Observer.—B. E. Rose.

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DISCHARGE MEASUREMENTS of Rose Creek near East End, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 26.....	M. H. French.....					0.12
April 29.....	F. R. Steinberger.....				0.16	0.64
May 19.....	do.....				0.18	0.75
June 11.....	do.....				0.15	0.58
July 8.....	do.....				0.10	0.05
Aug. 1.....	do.....				0.02	Nil.
Aug. 26.....	E. W. W. Hughes.....				0.14	0.07
Sept. 11.....	do.....				0.11	0.06

NOTE.—Measurements made with permanent weir.

DAILY GAUGE HEIGHT AND DISCHARGE of Rose Creek near East End, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.07	10.30	0.15	0.58	0.11	0.36
2.....			1.04	9.90	0.14	0.52	0.10	0.31
3.....			0.81	6.90	0.14	0.52	0.12	0.41
4.....			1.11	10.70	0.15	0.58	0.20	0.92
5.....			1.18	11.80	0.23	1.08	0.27	1.38
6.....			0.95	8.70	0.23	1.08	0.20	0.92
7.....			0.59	4.40	0.18	0.75	0.17	0.69
8.....			0.40	2.50	0.18	0.75	0.14	0.52
9.....			0.33	1.85	0.17	0.69	0.12	0.41
10.....			0.32	1.78	0.17	0.69	0.14	0.52
11.....			1.12	11.00	0.16	0.63	0.15	0.58
12.....			0.99	9.10	0.15	0.58	0.18	0.75
13.....	0.84	7.30	0.41	2.60	0.15	0.58	0.35	2.00
14.....	1.19	13.00	0.49	3.30	0.14	0.52	0.31	1.70
15.....	0.60	4.50	0.39	2.40	0.14	0.52	0.20	0.92
16.....	0.42	2.64	0.30	1.62	0.14	0.52	0.16	0.63
17.....	0.30	1.60	0.26	1.30	0.16	0.63	0.14	0.52
18.....	0.16	0.63	0.24	1.15	0.16	0.63	0.12	0.41
19.....	0.13	0.47	0.23	1.08	0.17	0.69	0.10	0.31
20.....	0.12	0.41	0.22	1.01	0.18	0.75	0.10	0.31
21.....	0.07	0.19	0.22	1.01	0.18	0.75	0.12	0.41
22.....	0.09 ^a	0.27	0.22	1.01	0.18	0.75	0.12	0.41
23.....			0.20	0.87	0.18	0.75	0.10	0.31
24.....			0.20	0.98	0.22	1.01	0.10	0.31
25.....			0.19	0.82	0.17	0.69	0.15	0.58
26.....			0.19	0.82	0.15	0.58	0.18	0.75
27.....			0.19	0.82	0.14	0.52	0.14	0.52
28.....			0.18	0.75	0.14	0.52	0.13	0.47
29.....			0.18	0.75	0.12	0.41	0.14	0.52
30.....			0.18	0.75	0.12	0.41	0.12	0.41
31.....	0.40	2.50			0.12	0.41		

^a to ^a Channel frozen.

DAILY GAUGE HEIGHT AND DISCHARGE of Rose Creek near East End, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.10	0.31	0.04	0.01	0.12	0.06	0.07	0.18
2.....	0.08	0.23	0.04	0.01	0.11	0.06	0.07	0.18
3.....	0.07	0.19	0.04	0.01	0.10	0.05	0.08	0.22
4.....	0.06	0.15	0.03	0.01	0.10	0.05	0.20	0.92
5.....	0.06	0.15	0.02	Nil	0.12	0.06	0.15	0.58
6.....	0.06	0.15	0.03	0.01	0.10	0.05	0.20	0.92
7.....	0.06	0.15	0.04	0.01	0.10	0.05	0.22	1.01
8.....	0.06	0.15	0.04	0.01	0.12	0.06	0.30	1.62
9.....	0.18 _a	0.12	0.08	0.04	0.14	0.08	0.27	1.38
10.....	0.18	0.12	0.08	0.04	0.12	0.06	0.22	1.01
11.....	0.16	0.10	0.06	0.02	0.12	0.06	0.16	0.63
12.....	0.08	0.04	0.06	0.02	0.18 _a	0.12	0.15	0.58
13.....	0.07	0.03	0.06	0.02	0.37	2.20	0.15	0.58
14.....	0.07	0.03	0.04	0.01	0.32	1.77	0.14	0.52
15.....	0.10	0.05	0.04	0.01	0.22	1.01	0.14	0.52
16.....	0.10	0.05	0.04	0.01	0.16	0.63	0.14	0.52
17.....	0.08	0.04	0.10	0.05	0.14	0.52	0.14	0.52
18.....	0.10	0.05	0.14	0.08	0.10	0.31	0.13	0.47
19.....	0.06	0.02	0.12	0.06	0.10	0.31	0.13	0.47
20.....	0.06	0.02	0.08	0.04	0.10	0.31	0.13	0.47
21.....	0.07	0.03	0.10	0.05	0.09	0.27	0.13	0.47
22.....	0.06	0.02	0.08	0.04	0.09	0.27	0.13	0.47
23.....	0.06	0.02	0.12	0.06	0.08	0.22	0.13	0.47
24.....	0.06	0.02	0.24	0.18	0.08	0.22	0.12	0.41
25.....	0.06	0.02	0.20	0.14	0.08	0.22	0.13	0.47
26.....	0.06	0.02	0.13	0.07	0.08	0.22	0.13	0.47
27.....	0.05	0.02	0.11	0.06	0.08	0.22	0.13	0.47
28.....	0.02	Nil	0.10	0.05	0.08	0.22	0.12	0.41
29.....	0.04	0.01	0.11	0.06	0.08	0.22	0.12	0.41
30.....	0.02	Nil	0.11	0.06	0.07	0.18	0.12	0.41
31.....	0.02	"	0.12	0.06	.....	.....	0.12	0.41

a to a Crest of weir reduced from 36 inches to 6 inches.

MONTHLY DISCHARGE of Rose Creek near East End, for 1914.

(Drainage area 13 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	13.00	.....	1.76	0.136	0.100	66
April.....	11.80	0.75	3.70	0.287	0.320	222
May.....	1.08	0.41	0.65	0.050	0.060	40
June.....	2.00	0.31	0.64	0.049	0.060	38
July.....	0.31	.....	0.07	0.006	0.007	5
August.....	0.18	.....	0.04	0.003	0.004	3
September.....	2.20	0.05	0.34	0.026	0.030	20
October.....	1.62	0.18	0.59	0.045	0.050	36
The period.....	.....	.....	.....	.....	0.631	430

SESSIONAL PAPER No. 25c

A. M. CROSS DITCH FROM CALF CREEK.

Location.—On SE. $\frac{1}{4}$ Sec. 5, Tp. 8, Rge. 22, W. 3rd Mer.

Records available.—June 1 to September 13, 1914.

Gauge.—Vertical staff, located about 40 feet from the intake of the ditch; elevation of the zero of the gauge has been maintained at 96.06 feet since establishment.

Bench-mark.—Is a poplar stump on the left bank of the ditch, surrounded by a cairn of stones; assumed elevation, 100.00 feet.

Channel.—Slightly shifting, owing to growth of weeds.

Discharge measurements.—Made with meter.

Observer.—A. M. Cross.

DISCHARGE MEASUREMENTS of A. M. Cross Ditch from Calf Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 20.....	F. R. Steinberger.....	5.2	1.99	0.93	1.46	1.87
Aug. 8.....	do.....	4.4	1.60	0.64	1.40	1.03
Aug. 27.....	E. W. W. Hughes.....	4.4	1.80	0.71	1.25	1.29

DAILY GAUGE HEIGHT AND DISCHARGE of A. M. Cross Ditch from Calf Creek, for 1914.

DAY.	June.		July.		August.		September.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.50	2.00	1.50	1.88	1.42	1.19	1.42	1.74
2.....	1.50	2.00	1.50	1.86	1.38	1.06	1.42	1.74
3.....	1.67	2.50	1.50	1.84	1.38	1.05	1.42	1.74
4.....	1.67	2.50	1.50	1.82	1.38	1.04	1.42	1.74
5.....	1.58	2.20	1.50	1.80	1.38	1.03	1.42	1.74
6.....	1.50	2.00	1.50	1.79	1.38	1.01	1.42	1.74
7.....	1.54	2.10	1.50	1.77	1.38	0.99	1.42	1.74
8.....	1.50	2.00	1.50	1.75	1.38	1.03	1.46	1.87
9.....	1.50	2.00	1.50	1.73	1.46	1.23	1.46	1.87
10.....	1.50	2.00	1.50	1.72	1.42	1.17	1.42	1.74
11.....	1.50	2.00	1.50	1.70	1.38	1.14	1.42	1.74
12.....	1.58	2.20	1.50	1.68	1.38	1.16	1.50	2.00
13.....	1.58	2.20	1.50	1.67	1.42	1.26	1.58	2.20
14.....	<i>a</i>		1.50	1.66	1.42	1.28		
15.....			1.50	1.64	1.38	1.24		
16.....			1.50	1.62	1.38	1.27		
17.....			1.50	1.60	1.38	1.30		
18.....			1.50	1.58	1.46	1.50		
19.....	<i>a</i>		1.46	1.48	1.42	1.46		
20.....	1.46	1.87 ^b	1.46	1.46	1.42	1.50		
21.....	1.54	2.10	1.42	1.36	1.42	1.54		
22.....	1.50	2.00	1.42	1.34	1.42	1.58		
23.....	1.50	1.98	1.42	1.32	1.42	1.62		
24.....	1.50	1.96	1.42	1.30	1.46	1.72		
25.....	1.50	1.94	1.42	1.28	1.46	1.75		
26.....	1.58	2.20	1.42	1.26	1.42	1.70		
27.....	1.58	2.10	1.42	1.24	1.42	1.74 ^b		
28.....	1.54	2.00	1.38	1.14	1.42	1.74		
29.....	1.50	1.92	1.38	1.13	1.42	1.74		
30.....	1.54	1.98	1.38	1.11	1.42	1.74		
31.....			1.42	1.21	1.46	1.87		

a to *a* Headgate closed.

b to *b* Shifting conditions.

MONTHLY DISCHARGE of A. M. Cross Ditch from Calf Creek, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
June.....	2.50	1.87	2.10	99
July.....	1.88	1.11	1.54	95
August.....	1.87	0.99	1.38	85
September (1-13).....	2.20	1.74	1.81	47
The period.....				326

F. CROSS DITCH FROM NORTH BRANCH OF FRENCHMAN RIVER.

Location.—On NW. $\frac{1}{4}$ Sec. 15, Tp. 7, Rge. 22, W. 3rd Mer., about 130 feet from the intake of the ditch.

Records available.—June, 1912, and May 16 to June 21, 1914.

Gauge.—Staff, fastened to the left side of the flume; elevation of the zero of the gauge, 94.45 feet.

Bench-mark.—Nut on the northwest corner of the floor of the bridge across the north branch of Frenchman River; assumed elevation, 100.00 feet.

Discharge measurements.—Made by meter at section or by a weir in ditch.

Observer.—Frank Cross.

DISCHARGE MEASUREMENTS of F. Cross Ditch from North Branch of Frenchman River, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 19.....	F. R. Steinberger.....				1.48	1.23 ^a
June 17.....	do.....				1.39	0.52 ^a

^a Weir measurement.

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DAILY GAUGE HEIGHT AND DISCHARGE OF F. CROSS Ditch from North Branch of Frenchman River, for 1914.

DAY.	May.		June	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			1.33	0.80
2.....			1.33	0.78
3.....			1.33	0.76
4.....			1.38	0.80
5.....			1.42	0.83
6.....			1.42	0.81
7.....			1.42	0.78
8.....			1.38	0.72
9.....			1.38	0.70
10.....			1.38	0.67
11.....			1.38	0.65
12.....			1.33	0.58
13.....			1.33	0.57
14.....			1.33	0.54
15.....			1.42	0.61
16.....	1.42	1.17	1.38	0.54
17.....	1.42	1.17	1.38	0.53
18.....	1.42	1.17	1.38	0.53
19.....	1.46	1.23	1.25	0.40
20.....	1.46	1.21	1.25	0.40
21.....	1.38	1.07	1.00	0.20
22.....	1.38	1.05		
23.....	1.38	1.03		
24.....	1.38	1.01		
25.....	1.38	0.99		
26.....	1.42	1.03		
27.....	1.42	1.01		
28.....	1.42	0.99		
29.....	1.42	0.97		
30.....	1.38	0.90		
31.....	1.38	0.88		

MONTHLY DISCHARGE OF F. CROSS Ditch from North Branch of Frenchman River, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
May (16-31).....	1.23	0.88	1.06	33
June (1-21).....	0.83	0.20	0.63	26
The period.....				59

NORTH BRANCH OF FRENCHMAN RIVER AT F. CROSS' RANCH.

Location.—On NE. $\frac{1}{4}$ Sec. 16, Tp. 7, Rge. 22, W. 3rd Mer., at F. Cross' ranch near East End.

Records available.—August 1, 1908, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge was 91.28 feet during 1908-11; 90.27 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Sandy and slightly shifting.

Discharge measurements.—Made by wading.

Winter flow.—Station not maintained during winter.

Diversions.—F. Cross, H. Cross, and W. F. McNicol divert water above this station for irrigation. F. Cross and H. Cross were the only ones to divert water during 1914.

Observer.—Frank Cross.

DISCHARGE MEASUREMENTS of North Branch of Frenchman River at F. Cross' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 18.....	M. H. French.....	10.3	3.86	4.38	4.15	16.9
Mar. 26.....	do.....	6.6	2.48	3.40	.....	8.5
April 2.....	do.....	10.0	9.40	7.00	5.05	66.0
April 13.....	do.....	10.4	10.40	6.73	3.62	70.0
April 20.....	do.....	11.0	8.60	1.52	1.21	13.1
April 29.....	F. R. Steinberger.....	12.3	8.43	1.27	1.20	10.7
May 19.....	do.....	11.5	5.87	1.19	1.08	7.0
June 18.....	do.....	11.6	4.18	1.00	0.95	4.2
July 20.....	do.....	12.5	3.85	0.65	0.89	16.5
Aug. 7.....	do.....	11.7	3.83	0.74	0.91	2.8
Aug. 14.....	E. W. W. Hughes.....	10.6	2.96	0.88	0.95	2.6
Aug. 27.....	do.....	11.7	4.92	0.81	1.00	4.1
Sept. 11.....	do.....	11.7	5.05	0.92	1.00	4.6
Sept. 14.....	do.....	11.9	13.60	1.64	1.44	22.0
Oct. 10.....	do.....	11.7	10.00	1.30	1.20	13.1

DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Frenchman River at F. Cross' Ranch, for 1914.

DAY.	April		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-f.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	4.95	70.0	1.19	10.7	1.07	6.8
2.....	4.85	66.0	1.21	11.5	1.06	6.5
3.....	4.35	25.0	1.21	11.5	1.00	4.9
4.....	4.85	74.0	1.21	11.5	1.09	7.4
5.....	4.85	88.0	1.29	15.0	1.31	16.0
6.....	4.75	90.0	1.32	16.5	1.20	11.1
7.....	4.75	102.0	1.32	16.5	1.14	9.0
8.....	4.55	96.0	1.32	16.5	1.08	7.1
9.....	4.05	60.0	1.23	12.3	1.02	5.4
10.....	3.75	47.0	1.24	12.7	1.03	5.7
11.....	3.65	49.0	1.24	12.7	1.03	5.7
12.....	3.75	69.0	1.23	12.3	1.07	6.8
13.....	3.55	65.0	1.22	11.9	1.09	7.4
14.....	3.00	37.0	1.22	11.9	1.31	16.0
15.....	2.25 ^a	30.0	1.21	11.5	1.11	8.0
16.....	1.50	26.0	1.20	11.1	1.01	5.2
17.....	1.48	25.0	1.10	7.7	0.99	4.7
18.....	1.35	18.0	1.10	7.7	0.95	3.8
19.....	1.35	18.0	1.09	7.4	0.95	3.8
20.....	1.35	18.0	1.00	4.9	0.95	3.8
21.....	1.35	18.0	0.99	4.7	1.02	5.4
22.....	1.34	17.5	1.00	4.9	1.08	7.1
23.....	1.33	17.0	1.00	4.9	0.96	4.0
24.....	1.32	16.5	1.12	8.3	1.08	7.1
25.....	1.31	16.0	1.11	8.0	1.08	7.1
26.....	1.32	16.5	1.09	7.4	1.11	8.0
27.....	1.32	16.5	1.08	7.1	1.07	6.8
28.....	1.21	11.5	1.05	6.2	1.05	6.2
29.....	1.20	11.1	1.07	6.8	1.04	5.9
30.....	1.21	11.5	1.08	7.1	1.04	5.9
31.....	1.08	7.1

^a Ice conditions April 1 to 15.

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DAILY GAUGE HEIGHT AND DISCHARGE of North Branch of Frenchman River at F. Cross' Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.02	5.4	0.91	3.0	1.01	5.2	1.04	5.9
2.....	1.00	4.9	0.92	3.2	1.00	4.9	1.04	5.9
3.....	0.99	4.7	0.93	3.4	0.98	4.5	1.03	5.7
4.....	0.97	4.2	0.92	3.2	0.98	4.5	1.15	9.3
5.....	0.97	4.2	0.92	3.2	0.98	4.5	1.20	11.1
6.....	0.96	4.0	0.91	3.0	1.00	4.9	1.18	10.4
7.....	0.94	3.6	0.92	3.2	1.00	4.9	1.12	8.3
8.....	0.94	3.6	0.91	3.0	1.01	5.2	1.35	18.0
9.....	0.95	3.8	0.96	4.0	1.06	6.5	1.35	18.0
10.....	0.95	3.8	1.00	4.9	1.03	5.7	1.20	11.1
11.....	0.96	4.0	0.97	4.2	1.00	4.9	1.12	8.3
12.....	0.96	4.0	0.96	4.0	1.05	6.2	1.11	8.0
13.....	0.97	4.2	0.98	4.5	1.32	16.5	1.11	8.0
14.....	0.95	3.8	0.96	4.0	1.46	24.0	1.11	8.0
15.....	0.93	3.4	0.95	3.8	1.32	16.5	1.09	7.4
16.....	0.93	3.4	0.94	3.6	1.18	10.4	1.08	7.1
17.....	0.92	3.2	0.94	3.6	1.09	7.4	1.09	7.4
18.....	0.91	3.0	1.03	5.7	1.04	5.9	1.08	7.1
19.....	0.91	3.0	1.01	5.2	1.04	5.9	1.09	7.4
20.....	0.90	2.8	0.99	4.7	1.03	5.7	1.09	7.4
21.....	0.90	2.8	0.95	3.8	1.03	5.7	1.09	7.4
22.....	0.90	2.8	0.95	3.8	1.03	5.7	1.10	7.7
23.....	0.89	2.6	0.96	4.0	1.03	5.7	1.10	7.7
24.....	0.89	2.6	1.10	7.7	1.03	5.7	1.10	7.7
25.....	0.91	3.0	1.05	6.2	1.03	5.7	1.10	7.7
26.....	0.95	3.8	1.03	5.7	1.03	5.7	1.10	7.7
27.....	0.93	3.4	1.03	5.7	1.04	5.9	1.11	8.0
28.....	0.92	3.2	1.02	5.4	1.04	5.9	1.12	8.3
29.....	0.92	3.2	1.02	5.4	1.04	5.9	1.12	8.3
30.....	0.91	3.0	1.02	5.4	1.04	5.9	1.13	8.7
31.....	0.90	2.8	1.01	5.2			1.13	8.7

MONTHLY DISCHARGE of North Branch of Frenchman River at F. Cross' Ranch, for 1914.

(Drainage area 53 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	102.0	11.1	41.0	0.770	0.86	2,428
May.....	16.5	4.7	9.9	0.186	0.21	608
June.....	16.0	3.8	7.0	0.131	0.15	414
July.....	5.4	2.6	3.6	0.067	0.08	219
August.....	7.7	3.0	4.4	0.083	0.10	269
September.....	24.0	4.5	7.1	0.133	0.15	421
October.....	18.0	5.7	8.6	0.163	0.19	531
The period.....					1.74	4,890

BOLINGBROKE DITCH NEAR EAST END.

Location.—On the NE. $\frac{1}{4}$ Sec. 7, Tp. 7, Rge. 22, W. 3rd Mer.

Records available.—May 27 to June 13, 1914.

Gauge.—Vertical staff, fastened to post on the left bank; elevation of the zero of the gauge maintained at 98.21 feet since establishment.

Bench-mark.—Wooden post, driven in left bank about 20 feet from the gauge; assumed elevation, 100.00 feet.

Discharge measurements.—Made with weir.

Observer.—J. Bolingbroke.

DISCHARGE MEASUREMENTS of Bolingbroke Ditch near East End, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 26.....	F. R. Steinberger.....				0.42	0.15

DAILY GAUGE HEIGHT AND DISCHARGE of Bolingbroke Ditch near East End, for 1914.

DAY.	May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....		0.28	0.03	
2.....		0.28	0.03	
3.....		0.29	0.03	
4.....		0.33	0.06	
5.....		0.33	0.06	
6.....		0.33	0.06	
7.....		0.31	0.05	
8.....		0.29	0.03	
9.....		0.29	0.03	
10.....		0.29	0.03	
11.....		0.33	0.06	
12.....		0.35	0.07	
13.....		0.42	0.16	
14.....				
15.....				
16.....				
17.....				
18.....				
19.....				
20.....				
21.....				
22.....				
23.....				
24.....				
25.....				
26.....				
27.....	0.27	0.02		
28.....	0.27	0.02		
29.....	0.27	0.02		
30.....	0.27	0.02		
31.....	0.27	0.02		

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MONTHLY DISCHARGE of Bolingbroke Ditch near East End, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
May (27-31)	0.02	0.02	0.02	0.2
June (1-13)	0.16	0.03	0.05	1.4
The period.....				1.6

BARROBY DITCH FROM NORTH BRANCH OF FRENCHMAN RIVER.

Location.—On the SE. $\frac{1}{4}$ Sec. 33, Tp. 6, Rge. 23, W. 3rd Mer.

Gauge.—Vertical staff, fastened to wall of headgate; elevation of the zero of the gauge has been maintained at 92.10 feet since establishment.

Bench-mark.—Wooden stake, driven in left bank about 30 feet from the gauge; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter.

Observer.—No observations in 1914.

DISCHARGE MEASUREMENTS of Barroby Ditch from North Branch of Frenchman River, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 27.....	F. R. Steinberger.....	3.5	3.50	0.52	2.02	1.84
July 20.....	do	3.5	1.75	0.34	0.58	0.53

FRENCHMAN RIVER AT PHILLIPS' RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 23, Tp. 6, Rge. 23, W. 3rd Mer., at A. Phillips' ranch near Ravenscrag.

Records available.—July 9, 1912, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been 90.02 feet since the station was established.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—Made by wading or from cable.

Winter flow.—Station not maintained during winter.

Artificial control.—A permanent control was established at this station during October, 1914, by which means more accurate records should be obtained at this station.

Observer.—A. A. Phillips.

DISCHARGE MEASUREMENTS of Frenchman River at Phillips' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 19.....	M. H. French.....	47.0	40.0	1.95	3.45	78.0
Mar. 23.....	do.....	31.0	26.0	1.14	3.00	30.0
April 6.....	do.....	55.0	141.0	4.55	4.55	642.0
April 10.....	do.....	45.0	82.0	2.89	3.10	236.0
April 13.....	do.....	45.0	131.0	5.64	4.33	738.0
April 21.....	do.....	38.0	43.0	2.09	1.95	90.0
May 7.....	F. R. Steinberger.....	45.0	54.0	1.02	1.69	55.0
May 25.....	do.....	44.0	48.0	0.74	1.50	35.0
June 26.....	do.....	43.0	40.0	0.57	1.39	23.0
July 21.....	do.....	22.0	9.7	0.54	1.04	5.2
Aug. 8.....	do.....	15.5	5.7	0.42	0.90	2.4
Aug. 20.....	E. W. W. Hughes.....	28.0	13.2	0.48	1.04	6.3
Sept. 15.....	do.....	44.0	48.0	0.78	1.57	37.7
Oct. 16.....	do.....	44.0	43.0	0.48	1.36	24.0

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at Phillips' Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....				45	1.60	43	1.35	20.0
2.....				60	1.58	41	1.34	19.4
3.....				100	1.58	41	1.34	19.4
4.....				250	1.57	40	1.39	23.0
5.....			4.57	400	1.61	44	1.49	32.0
6.....			4.52	642	1.63	47	1.46	29.0
7.....			4.37	520	1.66	50	1.47	30.0
8.....			3.72	410	1.68	53	1.44	27.0
9.....			3.42	320	1.84	74	1.39	23.0
10.....			2.95	236	1.88	79	1.34	19.4
11.....			2.78	380	1.84	74	1.34	19.4
12.....			3.65	610	1.79	67	1.42	26.0
13.....		5	4.24	738	1.72	57	1.47	30.0
14.....		5	3.62	479	1.68	53	1.49	32.0
15.....		45	3.42	413	1.62	45	1.49	32.0
16.....		550	3.21	351	1.56	39	1.45	28.0
17.....		300	2.53	190	1.57	40	1.42	26.0
18.....		150	2.26	141	1.54	37	1.31	17.6
19.....		78	2.14	119	1.53	36	1.28	15.8
20.....		65	1.99	95	1.52	35	1.27	15.2
21.....		60	1.92	85	1.50	33	2.05	105.0
22.....		40	1.86	76	1.48	31	1.66	50.0
23.....		30	1.79	67	1.49	32	1.53	36.0
24.....		30	1.76	62	1.59	42	1.44	27.0
25.....		30	1.72	57	1.52	35	1.39	23.0
26.....		25	1.69	54	1.48	31	1.37	22.0
27.....		20	1.65	49	1.41	25	1.38	22.0
28.....		20	1.64	48	1.40	24	1.35	20.0
29.....		20	1.64	48	1.40	24	1.35	20.0
30.....		25	1.61	44	1.40	24	1.34	19.4
31.....		40			1.40	24		

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DAILY GAUGE HEIGHT AND DISCHARGE OF Frenchman River at Phillips' Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.32	18.2	1.02	4.60	1.14	9.1	1.15	9.5
2.....	1.29	16.4	1.00	4.00	1.12	8.3	1.16	9.9
3.....	1.25	14.0	1.00	4.00	1.12	8.3	1.18	10.7
4.....	1.21	12.0	0.89	1.95	1.10	7.5	1.24	13.5
5.....	1.22	12.5	1.00	4.00	1.08	6.7	1.48	31.0
6.....	1.12	8.3	0.89	1.50	1.07	6.3	1.53	36.0
7.....	1.16	9.9	0.90	2.00	1.04	5.2	1.56	39.0
8.....	1.14	9.1	0.90	2.00	1.03	4.9	1.56	39.0
9.....	1.14	9.1	0.90	2.00	1.02	4.6	1.66	50.0
10.....	1.14	9.1	0.88	1.90	1.00	4.0	1.59	42.0
11.....	1.10	7.5	0.88	1.90	1.00	4.0	1.55	38.0
12.....	1.07	6.3	0.90	2.00	0.98	3.4	1.50	33.0
13.....	1.04	5.2	0.92	2.20	1.24	13.5	1.48	31.0
14.....	1.04	5.2	0.94	2.40	1.67	51.0	1.42	26.0
15.....	1.04	5.2	0.94	2.40	1.57	40.0	1.38	22.0
16.....	1.02	4.6	0.94	2.40	1.50	33.0	1.36	21.0
17.....	1.02	4.6	0.95	2.50	1.42	26.0	1.35	20.0
18.....	1.02	4.6	0.98	3.40	1.30	17.0	1.34	19.4
19.....	1.02	4.6	0.96	2.80	1.25	14.0	1.34	19.4
20.....	1.01	4.3	0.96	2.80	1.20	11.5	1.31	17.6
21.....	1.04	5.2	0.94	2.40	1.20	11.5	1.28	15.8
22.....	1.01	4.3	0.95	2.50	1.22	12.5	1.26	14.6
23.....	1.02	4.6	0.98	3.40	1.22	12.5	1.25	14.0
24.....	1.04	5.2	1.19	11.10	1.24	13.5	1.24	13.5
25.....	1.01	4.3	1.21	12.00	1.24	13.5	1.26	14.6
26.....	1.00	4.0	1.18	10.70	1.25	14.0	1.25	14.0
27.....	1.01	4.3	1.18	10.70	1.26	14.6	1.24	13.5
28.....	1.01	4.3	1.17	10.30	1.22	12.5	1.25	14.0
29.....	1.03	4.9	1.19	11.10	1.19	11.1	1.24	13.5
30.....	1.03	4.9	1.16	9.90	1.16	9.9	1.24	13.5
31.....	1.01	4.3	1.14	9.10			1.24	13.5

MONTHLY DISCHARGE OF Frenchman River at Phillips' Ranch, for 1914.

(Drainage area 598 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	550.0	5.00	81.0	0.135	0.095	3,050
April.....	738.0	44.00	236.0	0.395	0.441	14,043
May.....	79.0	24.00	43.0	0.071	0.082	2,619
June.....	105.0	15.20	28.0	0.046	0.051	1,697
July.....	18.2	4.00	7.1	0.012	0.014	437
August.....	12.0	1.50	4.8	0.008	0.009	295
September.....	51.0	3.40	13.5	0.023	0.026	803
October.....	50.0	9.50	22.0	0.037	0.043	1,353
The period.....					1.620	24,297

STRONG AND DAY DITCH AT EAST END.

Location.—On the NE. $\frac{1}{4}$ Sec. 25, Tp. 6, Rge. 22, W. 3rd Mer., about one-half mile below the headgate of the ditch.

Records available.—May 9, 1909, to December 31, 1914.

Gauge.—Staff, fastened to a post on right bank.

Bench-marks.—(1) A spike on the initial post, which is about six inches above ground, on the left bank of the ditch; elevation, 5.49 feet above the datum of the gauge. (2) The top of a plug, about four inches above ground, on the right bank and about 50 feet downstream from the gauge; elevation, 7.52 feet above the datum of the gauge.

Channel.—Slightly shifting and affected by growth of weeds.

Discharge measurements.—Made by wading.

Observer.—M. L. Krewet.

DISCHARGE MEASUREMENTS of Strong and Day Ditch at East End, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 2	F. R. Steinberger.....	7.3	7.6	0.91	1.00	7.00
May 22	do	17.3	16.8	1.17	1.61	19.60
June 22	do	17.1	19.3	0.65	1.64	12.60
July 16	do	7.3	2.4	0.34	0.60	0.82

DAILY GAUGE HEIGHT AND DISCHARGE of Strong and Day Ditch at East End, for 1914.

DAY.	May.		June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.55	15.8	1.80	15.60
2.....	1.00	7.0	1.65	17.8	1.80	15.60
3.....	1.30 ^a	12.6	1.45	13.2	1.70	13.80
4.....	1.50 ^a	17.0	1.55	15.0	1.70	13.80
5.....	1.60 ^a	19.2	1.55	14.8	1.70	13.80
6.....	1.60 ^a	19.2	1.55	14.6	1.60	12.00
7.....	1.60 ^a	19.2	1.65	16.5	1.40	9.00
8.....	1.60 ^a	19.2	1.55	14.1	1.30	7.60
9.....	1.60 ^a	19.2	1.45	11.8	1.10	5.00
10.....	1.60 ^a	19.2	1.55	13.7	1.00	4.00
11.....	1.60 ^a	19.2	1.55	13.5	1.00	4.00
12.....	1.60 ^a	19.2	1.55	13.2	0.90	3.00
13.....	1.60 ^a	19.2	1.55	13.0	0.80	2.10
14.....	1.60 ^a	19.2	1.45	10.7	0.70	1.40
15.....	1.60 ^a	19.2	1.45	10.5	0.60	0.85
16.....	1.60 ^a	19.2	1.55	12.2	0.60	0.85
17.....	1.60 ^a	19.2	1.55	12.0	0.51	0.44
18.....	1.60 ^a	19.2	1.45	9.8	0.47	0.31
19.....	1.60 ^a	19.2	1.55	11.5	0.23	0.00
20.....	1.60 ^a	19.2	1.45	9.3	Dry.	Nil.
21.....	1.60 ^a	19.2	1.45	9.1	"	"
22.....	1.61	19.6	1.64	12.7	"	"
23.....	1.60	19.2	1.30	7.6	"	"
24.....	1.57	18.1	1.40	9.0	0.40	0.10
25.....	1.57	17.9	1.50	10.4	0.35	Nil.
26.....	1.55	17.3	1.40	9.0	0.35	"
27.....	1.65	19.3	1.50	10.4	0.42	0.16
28.....	1.55	16.7	1.50	10.4	0.34	Nil.
29.....	1.65	18.9	1.60	12.0	Dry.	"
30.....	1.55	16.3	1.60	12.0	"	"
31.....	1.65	18.3			"	"

^a Gauge height interpolated.

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MONTHLY DISCHARGE of Strong and Day Ditch at East End, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
May (2-31).....	19.2	7.00	18.2	1,083
June.....	17.8	7.60	12.2	726
July.....	15.6	0.00	4.0	245
The period.....				2,054

FRENCHMAN RIVER AT EAST END.

Location.—On the NE. $\frac{1}{4}$ Sec. 31, Tp. 6, Rge. 21, W. 3rd Mer., at Strong and Day's highway bridge. Moved August 21 to Canadian Pacific Railway bridge in the SE. $\frac{1}{4}$ of the same section, about one-half mile east of East End Railway depot, and about three-quarters of a mile below the old gauging station.

Records available.—April 21, 1909, to October 31, 1914.

Gauge.—Chain gauge at the abandoned station. Vertical staff at new station, fastened to the downstream pile of the fourth bent from the west end of the bridge. The elevation of the zero of the gauge is 2,958.84 feet above sea level.

Bench-mark.—On southeast corner of the cap of the first bent from the east abutment of the bridge; elevation, 2,974.92 feet above sea level (Canadian Pacific Railway datum).

Channel.—Permanent.

Discharge measurements.—Made by wading or from bridge.

Winter flow.—Station not maintained in winter.

Artificial control.—A permanent control for the gauge was established during October, one-quarter mile downstream from the bridge.

Diversions.—Messrs. Strong and Day divert water for irrigation purposes about two miles upstream from this station. A small amount returns to the river channel above the gauge.

Observer.—M. L. Krewet and S. B. C. Gooch.

DISCHARGE MEASUREMENTS of Frenchman River at East End, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 14.....	M. H. French.....	37.5	249.00	2.17	5.66	540.00
April 17.....	do.....	59.0	86.40	3.10	4.41	268.00
April 18.....	do.....	57.0	55.50	3.44	4.10	191.00
April 20.....	do.....	36.0	43.50	2.18	3.64	95.00
May 2.....	F. R. Steinberger.....	33.5	30.30	1.23	3.28	37.00
May 22.....	do.....	32.6	25.20	0.59	3.25	14.80
June 22.....	do.....	39.5	38.80	1.46	3.24	55.00
July 16.....	do.....	12.4	5.48	0.80	3.12	4.40
Aug. 4.....	do.....	9.2	3.58	0.85	3.06	3.00
Aug. 15.....	E. W. W. Hughes.....	22.2	2.23	0.29	3.18	2.10
Aug. 27.....	do.....	9.2	2.83	0.64	0.74	1.81 ^a
Sept. 17.....	do.....	51.0	51.00	0.42	1.34	21.00 ^a

^a New station.

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at East End, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....				45.0	3.08	18.6	3.21	23.00
2.....				62.0	3.07	17.9	3.19	22.00
3.....				105.0	3.06	17.2	3.17	21.00
4.....				235.0	3.07	17.9	3.07	12.00
5.....				400.0	3.08	18.6	2.97	6.00
6.....				500.0	3.07	17.9	3.07	14.00
7.....				800.0	3.06	17.2	2.91	4.00
8.....				650.0	3.08	18.6	2.98	8.50
9.....				475.0	3.09	20.0	3.07	17.50
10.....				360.0	3.11	22.0	2.89	4.50
11.....				280.0	3.12	22.0	2.81	2.00
12.....				260.0 ^a	3.10	21.0	2.69	0.50
13.....		5 ^a	6.71	889.0	3.08	18.6	2.81	2.70
14.....		5	5.58	585.0	3.06	17.2	2.78	2.00
15.....		45	5.01	431.0	3.02	14.4	2.68	0.75
16.....		550	4.71	350.0	3.06	17.2	2.78	2.50
17.....		310	4.56	308.0	3.06	17.2	2.89	9.00
18.....		170	4.06	180.0	3.09	20.0	2.94	14.00
19.....		80	3.84	133.0	3.08	18.6	2.87	9.00
20.....		75	3.61	89.0	3.06	17.2	3.01	23.00
21.....		50	3.56	80.0	3.07	17.9	3.64	121.00
22.....		40	3.16	25.0	3.25	15.5	3.25	56.00
23.....		40	3.36	48.0	3.21	12.0	3.21	24.00 ^b
24.....		37	3.26	35.0	3.24	15.5	3.31	20.00
25.....		30	3.16	25.0	3.22	15.5	3.41	12.60
26.....		22	3.08	18.6	3.21	15.5	3.53	13.00
27.....		20	3.08	18.6	3.22	17.5	3.60	11.60
28.....		20	3.08	18.6	3.21	17.5	3.73	9.60
29.....		20	3.06	17.2	3.21	19.0	3.67	8.00
30.....		25	3.06	17.2	3.20	19.5	3.63	7.40 ^b
31.....		40			3.20	20.0		

^a Discharge estimated March 13 to April 12.^b Discharge June 23 to 30 computed from station at Phillips' ranch.

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DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at East End, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec. ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.94	9.0	3.07	3.10	0.80	2.5	1.01	7.8
2.....	2.91	6.5	3.07	3.10	0.80	2.5	1.02	8.1
3.....	2.84	3.0	3.07	3.10	0.80	2.5	1.10	10.5
4.....	2.82	2.0	3.07	3.10	0.80	2.5	1.18	13.2
5.....	2.79	1.0	3.08	3.40	0.81	2.7	1.30	19.5
6.....	2.84	2.0	3.08	3.40	0.83	3.1	1.42	26.0
7.....	2.88	2.5	3.07	3.10	0.83	3.1	1.35	22.0
8.....	2.93	3.5	3.08	3.40	0.83	3.1	1.45	28.0
9.....	2.96	4.0	3.09	3.70	0.83	3.1	1.52	32.0
10.....	2.94	3.0	3.09	3.70	0.83	3.1	1.53	33.0
11.....	2.87	1.5	3.08	3.40	0.83	3.1	1.42	26.0
12.....	2.84	1.0	3.08	3.40	0.83	3.1	1.32	20.0
13.....	2.88	1.9	3.07	3.10	1.14	11.7	1.33	21.0
14.....	2.95	3.0	3.07	3.10	1.47	29.0	1.35	22.0
15.....	2.92	3.5	3.07	3.10	1.54	33.0	1.42	26.0
16.....	2.92c	4.4	3.08	3.40	1.40	25.0	1.62	39.0
17.....	2.79c	4.3	3.09	3.70	1.34	22.0	1.60	37.0
18.....	2.75c	9.4	3.11	4.50	1.19	14.6	1.52	32.0
19.....	3.11	4.5	3.12	5.00	1.13	11.4	1.52	32.0
20.....	3.14	6.0	3.09	3.70	1.09	10.2	1.52	32.0
21.....	3.13	5.5	3.07	3.10	1.05	9.0	1.52	32.0
22.....	3.08	3.4	0.74d	1.78	1.05	9.0	1.51	32.0
23.....	3.10	4.0	0.78	2.30	1.02	8.1	1.51	32.0
24.....	3.12	5.0	0.78	2.30	1.00	7.5	1.50	31.0
25.....	3.10	4.0	0.80	2.50	1.00	7.5	1.50	31.0
26.....	3.11	4.5	0.82	2.90	1.00	7.5	1.50	31.0
27.....	3.10	4.0	0.78	2.30	1.00	7.5	1.49	30.0
28.....	3.09	3.7	0.80	2.50	1.00	7.5	1.49	30.0
29.....	3.08	3.4	0.80	2.50	1.00	7.5	1.50	31.0
30.....	3.07	3.1	0.80	2.50	1.00	7.5	1.50	31.0
31.....	3.07	3.1	0.80	2.50	.....	.....	1.50	31.0

c Discharge obtained from weir measurements.

d New station established.

MONTHLY DISCHARGE of Frenchman River at East End, for 1914.

(Drainage area 648 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	550	5.00	83.0	0.129	0.091	3,141
April.....	889	17.20	247.0	0.382	0.426	14,722
May.....	41	25.00	36.0	0.028	0.032	2,183
June.....	130	11.20	28.0	0.025	0.028	1,678
July.....	25	3.10	7.9	0.006	0.007	481
August.....	5	1.78	3.1	0.005	0.006	192
September.....	33	2.50	9.0	0.014	0.016	536
October.....	39	7.80	27.0	0.041	0.047	1,642
The period.....					0.653	24,578

NOTE.—This table shows the total discharge of the river and Strong and Day's ditch at this point.

MORRISON BROTHERS DITCH FROM FRENCHMAN RIVER.

Location.—On the SW. $\frac{1}{4}$ Sec. 26, Tp. 6, Rge. 21, W. 3rd Mer., about three miles downstream from East End.

Records available.—June 12 to August 28, 1913; May 25 to October 30, 1914.

Gauge.—Vertical staff, fastened to a post at the right bank about one-half mile from the headgate; the elevation of the zero of the gauge has been maintained at 97.36 feet since establishment.

Bench-mark.—Top of rock marked B.M. in red, located on the left bank about 300 feet upstream from the gauge; assumed elevation, 100.00 feet.

Channel.—Slightly grown with weeds.

Discharge measurements.—Made with meter.

Observer.—A. A. Morrison.

DISCHARGE MEASUREMENTS of Morrison Brothers' Ditch from Frenchman River, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 22.....	F. R. Steinberger.....	11.0	15.60	1.31	1.67	16.10
July 14.....	do.....	7.3	3.31	0.52	0.48	1.73

DAILY GAUGE HEIGHT AND DISCHARGE of Morrison Brothers' Ditch from Frenchman River, for 1914.

DAY.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			0.62a	2.70	1.04a	6.8					b	
2.....			0.58	2.40	1.00	6.3					0.92	5.4
3.....			0.69a	3.30	0.92	5.4					0.92	5.4
4.....			0.81a	4.40	0.75	3.8					0.92a	5.4
5.....			0.92	5.40	b						0.92	5.4
6.....			0.83	4.60							0.92	5.4
7.....			0.77a	4.00							0.92	5.4
8.....			0.71a	3.50							0.92	5.4
9.....			0.65a	3.00							0.92a	5.4
10.....			0.59a	2.40							0.92	5.4
11.....			0.55a	2.20							0.92	5.4
12.....			0.50	1.80							0.87a	4.9
13.....			1.00	6.30							0.83	4.6
14.....			1.25a	9.50							0.83	4.6
15.....			1.50	13.30							0.83a	4.6
16.....			1.50	13.30							0.75a	3.8
17.....			1.42	12.00							0.75	3.8
18.....			1.21a	8.90							0.75	3.8
19.....			1.00	6.30							0.75a	3.8
20.....			0.83	4.60							0.75a	3.8
21.....			1.25a	9.50							0.75	3.8
22.....			1.67	16.30							0.75	3.8
23.....			1.50	13.30							0.75	3.8
24.....			1.42	12.00							0.75a	3.8
25.....	0.83	4.60	1.33	10.60							0.75a	3.8
26.....	0.83	4.60	1.33	10.60							0.75	3.8
27.....	0.83	4.60	1.17	8.40							0.75a	3.8
28.....	0.71a	3.50	1.17	8.40							0.75a	3.8
29.....	0.50	1.80	1.17	8.40							0.75	3.8
30.....	0.50	1.80	1.08	7.30							0.75	3.8
31.....	0.67	3.10										

a Gauge height interpolated.

b to b Headgate closed.

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MONTHLY DISCHARGE of Morrison Brothers' Ditch from Frenchman River, for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
May (25-31).....	4.60	1.80	3.40	48
June.....	16.3	1.80	7.30	434
July (1-4).....	6.8	3.80	5.60	44
August.....				
September.....				
October (2-30).....	5.4	3.80	4.50	257
The period.....				783

MULE CREEK AT GUNN'S RANCH.

Location.—On SW. $\frac{1}{4}$ Sec. 33, Tp. 5, Rgc. 17, W. 3rd Mer.

Records available.—April 15 to October 31, 1914. Previous records at old station about one-half mile downstream from present site consist of discharge measurements made during 1911, 1912, and 1913.

Gauge.—Vertical staff, fastened to a post on the left bank about $1\frac{1}{2}$ miles south of Mr. Gunn's ranch; the elevation of the zero of the gauge has been maintained at 91.50 feet since establishment.

Bench-mark.—Permanent iron bench-mark, located on the left bank about 30 feet from the gauge; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter; with weir at low stages.

Channel.—Probably permanent.

Winter flow.—This station is not maintained during the winter.

Diversions.—There is no diversion above this stream.

Observer.—Wm. Gunn, Jr.

DISCHARGE MEASUREMENTS of Mule Creek at Gunn's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 15.....	E. W. W. Hughes.....	4.1	2.94	0.58	1.98	1.72
April 15.....	do.....				1.97	1.90 ^a
May 14.....	do.....				1.29	0.27 ^a
July 21.....	do.....				1.21	0.06 ^a
Oct. 22.....	do.....				1.28	0.29 ^a

^a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Mule Creek at Gunn's Ranch, for 1914.

Day.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			1.20	0.08	1.24	0.14
2.....			1.26	0.17	1.25	0.15
3.....			1.20	0.08	1.33	0.32
4.....			1.25	0.15	1.58	1.92
5.....			1.21	0.09	2.25	2.60
6.....			1.18	0.06	3.30	5.22
7.....			1.16	0.04	1.75	1.34
8.....			1.14	0.03	1.45	0.80
9.....			1.12	0.02	1.40	0.48
10.....			1.10	0.01	1.60	0.97
11.....			1.10	0.01	2.00	1.97
12.....			1.12	0.02	3.50	5.70
13.....			1.29	0.23	4.00	6.00
14.....			1.29	0.23	3.00	4.50
15.....	1.97	1.90	1.27	0.19	1.95	1.84
16.....	1.95	1.84	1.28	0.21	1.65	1.10
17.....	1.89	1.70	1.24	0.14	1.43	0.55
18.....	1.71	1.24	1.25	0.15	1.35	0.36
19.....	1.65	1.10	1.23	0.12	1.25	0.15
20.....	1.64	1.07	1.21	0.09	1.35	0.36
21.....	1.52	0.77	1.24	0.14	1.38	0.43
22.....	1.43	0.55	1.26	0.17	1.25	0.15
23.....	1.40	0.48	1.28	0.21	1.20	0.08
24.....	1.43	0.55	1.30	0.25	1.22	0.10
25.....	1.33	0.32	1.27	0.19	1.25	0.15
26.....	1.30	0.25	1.25	0.15	1.45	0.60
27.....	1.33	0.32	1.25	0.15	1.43	0.55
28.....	1.20	0.08	1.23	0.12	1.38	0.43
29.....	1.25	0.15	1.20	0.08	1.35	0.36
30.....	1.28	0.21	1.23	0.12	1.28	0.21
31.....			1.22	0.10		

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DAILY GAUGE HEIGHT AND DISCHARGE of Mule Creek at Gunn's Ranch, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.35	0.36	1.30	0.25	1.20	0.08	1.16	0.04
2.....	1.35	0.36	1.26	0.17	1.22	0.10	1.19	0.07
3.....	1.30	0.25	1.25	0.15	1.21	0.09	1.92	1.77
4.....	1.32	0.29	1.20	0.08	1.23	0.12	2.16	2.40
5.....	1.33	0.32	1.24	0.14	1.20	0.08	2.21	2.50
6.....	1.30	0.25	1.26	0.17	1.16	0.04	2.41	3.00
7.....	1.30	0.25	1.28	0.21	1.17	0.05	2.16	2.40
8.....	1.32	0.29	1.23	0.12	1.19	0.07	2.11	2.20
9.....	1.31	0.27	1.25	0.15	1.20	0.08	2.01	2.00
10.....	1.75	1.34	1.29	0.23	1.18	0.06	1.95	1.84
11.....	1.95	1.84	1.27	0.19	1.21	0.09	1.80	1.47
12.....	1.65	1.10	1.26	0.17	1.19	0.07	1.74	1.32
13.....	1.40	0.48	1.28	0.21	3.45	5.60	1.54	0.82
14.....	1.35	0.36	1.26	0.17	2.24	2.60	1.45	0.60
15.....	1.34	0.34	1.27	0.19	1.54	0.82	1.50	0.72
16.....	1.32	0.29	1.24	0.14	1.44	0.58	1.38	0.43
17.....	1.35	0.36	1.23	0.12	1.49	0.70	1.35	0.36
18.....	1.38	0.43	1.27	0.19	1.49	0.70	1.30	0.25
19.....	1.34	0.34	1.32	0.29	1.44	0.58	1.27	0.19
20.....	1.28	0.21	1.28	0.21	1.39	0.46	1.24	0.14
21.....	1.26	0.17	1.26	0.17	1.33	0.32	1.21	0.09
22.....	1.28	0.21	1.23	0.12	1.28	0.21	1.28	0.21
23.....	1.30	0.25	1.22	0.10	1.21	0.09	1.31	0.27
24.....	1.28	0.21	1.22	0.10	1.17	0.05	1.30	0.25
25.....	1.25	0.15	1.23	0.12	1.19	0.07	1.30	0.25
26.....	1.27	0.19	1.21	0.09	1.21	0.09	1.27	0.19
27.....	1.30	0.25	1.19	0.07	1.23	0.12	1.29	0.23
28.....	1.24	0.14	1.21	0.09	1.21	0.09	1.25	0.15
29.....	1.23	0.12	1.17	0.05	1.20	0.08	1.26	0.17
30.....	1.26	0.17	1.22	0.10	1.18	0.06	1.32	0.29
31.....	1.28	0.21	1.23	0.12			1.30	0.25

MONTHLY DISCHARGE of Mule Creek at Gunn's Ranch, for 1914.

(Drainage area 60 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (15-30).....	1.90	0.08	0.78	0.013	0.001	25
May.....	0.25	0.01	0.12	0.002	0.002	8
June.....	6.00	0.08	1.31	0.022	0.024	78
July.....	1.84	0.12	0.38	0.006	0.007	23
August.....	0.29	0.05	0.15	0.002	0.003	9
September.....	5.60	0.04	0.47	0.008	0.009	28
October.....	3.00	0.04	0.87	0.014	0.016	53
The period.....					0.062	224

FRENCHMAN RIVER AT "76" RANCH.

Location.—On the SE. $\frac{1}{4}$ Sec. 27, Tp. 5, Rge. 16, W. 3rd Mer., at the "76" ranch, near Waldville post office.

Records available.—April 10 to October 31, 1914.

Gauge.—Vertical staff, fastened to post on left bank, about one-quarter mile south of "76" ranch house; the elevation of the zero of the gauge is 87.95 feet.

Bench-mark.—Permanent iron bench-mark, located about five feet west of the sill of the north tower of the cable; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made by wading, or from cable.

Floods.—On account of the crooked channel above this station, floods during the spring are caused by ice jams.

Winter flow.—Station not maintained during winter.

Diversions.—Messrs. Morrison Brothers, Duncan and Watson divert water from the stream some 50 miles above the station.

Observer.—Mrs. Raymond A. Cole.

DISCHARGE MEASUREMENTS of Frenchman River at "76" Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 11.....	E. W. W. Hughes.....	70.8	189.0	2.00	4.92	378.0
April 11.....	do.....	71.5	208.0	2.33	4.97	485.0
April 12.....	do.....	72.0	225.0	2.49	5.04	560.0
April 17.....	do.....	68.3	209.0	2.00	4.32	418.0
May 13.....	do.....	59.5	57.1	1.23	2.66	70.0
May 15.....	do.....	58.1	57.3	1.20	2.80	69.0
July 20.....	do.....	16.8	7.4	0.28	1.46	2.1
Oct. 23.....	do.....	28.5	15.0	1.16	2.00	17.4

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at "76" Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....					1.90	13.0
2.....					1.80	9.5
3.....					1.90	13.0
4.....					1.90	13.0
5.....					2.00	17.0
6.....					2.50	48.0
7.....					3.00	107.0
8.....					2.75	74.0
9.....					2.20	27.0
10.....	5.46	741			2.52	50.0
11.....	5.31	699			2.35	36.0
12.....	5.67	800			2.20	27.0
13.....	4.56	489	2.67	65	2.25	30.0
14.....	4.43	452	2.86	87	2.30	33.0
15.....	5.31	699	2.59	57	2.30	33.0
16.....	4.98	606	2.46	45	2.25	30.0
17.....	4.36	433	2.61	59	2.10	21.0
18.....	4.18	382	2.51	49	1.90	13.0
19.....	3.89	301	2.46	45	1.85	11.0
20.....	3.68	247	2.41	41	1.78	8.9
21.....	3.46	194	2.31	34	1.70	6.8
22.....			2.30	33	1.70	6.8
23.....			2.29	32	1.70	6.8
24.....			2.26	31	1.75	8.0
25.....			2.21	28	1.80	9.5
26.....			2.18	26	1.70	6.8
27.....			2.18	26	1.80	9.5
28.....			2.17	25	1.90	13.0
29.....			2.17	25	1.80	9.5
30.....			2.16	25	1.80	9.5
31.....			2.17	25		



Gauging Station on Frenchman River at "76" Ranch. Taken by R. J. Burley.



Gauging Station on Frenchman River at Buzzard's Ranch. Taken by R. J. Burley.

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DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at "76" Ranch, for 1914.
—Continued.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.80 ^a	9.50	1.15	0.70	1.05	0.40	1.64	5.3
2.....	1.80 ^a	9.50	1.16	0.73	1.03	0.36	1.63	5.1
3.....	1.80	9.50	1.15	0.70	1.02	0.34	1.66	5.8
4.....	1.81	9.80	1.11	0.58	1.02	0.34	1.75	8.0
5.....	1.75	8.00	1.11	0.58	0.99	0.28	1.79	9.2
6.....	1.70	6.80	1.10	0.55	0.95	0.20	1.85	11.0
7.....	1.78	8.90	1.08	0.49	0.95	0.20	2.10	21.0
8.....	1.60	4.50	1.08	0.49	0.96	0.22	1.86	11.4
9.....	1.50	2.80	1.06	0.43	0.92	0.14	1.90	13.0
10.....	1.48	2.40	1.04	0.38	0.91	0.12	2.10	21.0
11.....	1.50	2.80	1.02	0.34	0.92	0.14	2.20	27.0
12.....	1.50	2.80	1.02	0.34	0.95	0.20	2.20	27.0
13.....	1.46	2.20	1.02	0.34	1.05	0.40	2.15	24.0
14.....	1.42	1.82	1.01	0.32	1.70	6.80	2.13	23.0
15.....	1.50	2.80	1.01	0.32	1.68	6.20	2.05	19.0
16.....	1.48	2.40	1.01	0.32	1.55	3.50	2.02	17.8
17.....	1.30	1.20	1.00	0.30	1.70	6.80	2.01	17.1
18.....	1.35	1.45	0.80	Nil.	1.69	6.50	2.00	17.0
19.....	1.35	1.45	0.80	"	1.90	13.00	1.94	14.6
20.....	1.51	2.90	0.80	"	1.91	13.40	1.92	13.8
21.....	1.40	1.70	0.80	"	1.88	12.20	1.87	11.8
22.....	1.39	1.65	0.81	"	1.86	11.40	1.82	10.1
23.....	1.25	1.00	0.80	"	1.90	13.00	1.95	15.0
24.....	1.26	1.04	1.10	0.55	1.86	11.40	1.95	15.0
25.....	1.23	0.94	1.10	0.55	1.80	9.50	1.92	13.8
26.....	1.25	1.00	0.90	0.10	1.74	7.80	1.88	12.2
27.....	1.27	1.08	1.00	0.30	1.68	6.20	1.86	11.4
28.....	1.27	1.08	1.00	0.30	1.68	6.20	1.86	11.4
29.....	1.26	1.04	0.82	Nil.	1.65	5.50	1.87	11.8
30.....	1.23	0.94	0.90	0.10	1.64	5.30	1.89	12.6
31.....	1.20	0.85	0.90	0.10	.....	.....	1.90	13.0

^a Gauge height interpolated.

MONTHLY DISCHARGE of Frenchman River at "76" Ranch, for 1914.

(Drainage area 1,106 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (10-21).....	800.00	194.00	504.00	0.4560	0.2030	11,983
May (13-31).....	87.00	25.00	40.00	0.0360	0.0250	1,503
June.....	107.00	6.80	23.40	0.0210	0.0230	1,393
July.....	9.80	0.85	3.40	0.0030	0.0040	210
August.....	0.73	0.00	0.32	0.0003	0.0004	20
September.....	13.40	0.12	4.90	0.0040	0.0040	294
October.....	27.00	5.10	14.50	0.0130	0.0150	891
The period.....	.....	.....	.....	.....	0.2744	16,294

BATE CREEK AT BATE'S RANCH.

Location.—On NW. $\frac{1}{4}$ Sec. 6, Tp. 6, Rge. 16, W. 3rd Mer., near Nummola post office.

Records available.—April 15 to October 31, 1914.

Gauge.—Vertical staff, fastened to a post on right bank about one-quarter mile from Mr. Bate's house; the elevation of the zero of the gauge has been 94.87 feet since establishment.

Bench-mark.—Wooden plug, driven in the left bank, 36 feet from the gauge; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made with meter and weir.

Diversions.—Mr. Bate diverts water for irrigation purposes above the gauge.

Observer.—A. E. Bate.

DISCHARGE MEASUREMENTS of Bate Creek at Bate's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 16.....	E. W. W. Hughes.....				1.71	1.23
May 14.....	do.....				1.49	0.34
July 21.....	do.....				1.20	Nil.
Oct. 23.....	do.....				1.42	0.15

DAILY GAUGE HEIGHT AND DISCHARGE of Bate Creek at Bate's Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.62	0.83	1.40	0.11
2.....			1.61	0.78	1.42	0.15
3.....			1.56	0.60	1.46	0.25
4.....			1.53	0.49	1.58	0.67
5.....			1.52	0.45	1.54	0.52
6.....			1.51	0.42	1.49	0.35
7.....			1.50	0.38	1.50	0.38
8.....			1.47	0.28	1.42	0.15
9.....			1.48	0.32	1.41	0.13
10.....			1.48	0.32	1.42	0.15
11.....			1.46	0.25	1.43	0.18
12.....			1.45	0.22	1.54	0.52
13.....			1.42	0.15	1.72	1.28
14.....			1.48	0.32	1.56	0.60
15.....	1.92	2.37	1.47	0.28	1.48	0.32
16.....	1.77	1.53	1.50	0.38	1.46	0.25
17.....	1.72	1.28	1.50	0.38	1.44	0.20
18.....	1.75	1.42	1.48	0.32	1.42	0.15
19.....	1.80	1.70	1.48	0.32	1.40	0.11
20.....	1.78	1.59	1.48	0.32	1.40	0.11
21.....	1.72	1.28	1.48	0.32	1.44	0.20
22.....	1.73	1.32	1.48	0.32	1.41	0.13
23.....	1.74	1.37	1.48	0.32	1.40	0.11
24.....	1.73	1.32	1.50	0.38	1.38	0.08
25.....	1.68	1.09	1.47	0.28	1.46	0.25
26.....	1.67	1.05	1.46	0.25	1.45	0.22
27.....	1.66	1.00	1.44	0.20	1.33	0.18
28.....	1.65	0.96	1.45	0.22	1.40	0.11
29.....	1.65	0.96	1.44	0.20	1.45	0.22
30.....	1.65	0.96	1.43	0.18	1.42	0.15
31.....			1.42	0.15		

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DAILY GAUGE HEIGHT AND DISCHARGE of Bate Creek at Bate's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.38	0.08	1.30	0.02	1.37	0.07	1.41	0.13
2.....	1.38	0.08	1.28	0.02	1.36	0.05	1.42	0.15
3.....	1.35	0.04	1.20	Nil	1.34	0.04	1.42	0.15
4.....	1.32	0.03	1.21	"	1.36	0.05	1.46	0.25
5.....	1.36	0.05	1.17	"	1.36	0.05	1.45	0.22
6.....	1.36	0.05	1.18	"	1.35	0.04	1.45	0.22
7.....	1.38	0.08	1.16	"	1.36	0.05	1.50	0.38
8.....	1.32	0.03	1.21	"	1.39	0.10	1.55	0.56
9.....	1.36	0.05	1.26	0.01	1.40	0.11	1.46	0.25
10.....	1.36	0.05	1.25	0.01	1.37	0.07	1.46	0.25
11.....	1.36	0.05	1.21	Nil	1.36	0.05	1.44	0.20
12.....	1.31	0.02	1.20	"	1.38	0.08	1.42	0.15
13.....	1.28	0.02	1.20	"	1.84	1.92	1.42	0.15
14.....	1.27	0.01	1.15	"	1.55	0.56	1.42	0.15
15.....	1.30	0.02	1.15	"	1.44	0.20	1.42	0.15
16.....	1.22	Nil	1.15	"	1.42	0.15	1.42	0.15
17.....	1.25	0.01	1.20	"	1.40	0.11	1.42	0.15
18.....	1.20	Nil	1.28	0.02	1.39	0.10	1.42	0.15
19.....	1.20	"	1.26	0.01	1.40	0.11	1.42	0.15
20.....	1.22	"	1.30	0.02	1.40	0.11	1.42	0.15
21.....	1.20	"	1.28	0.02	1.40	0.11	1.42	0.15
22.....	1.20	"	1.24	0.01	1.40	0.11	1.42	0.15
23.....	1.20	"	1.30	0.02	1.40	0.11	1.42	0.15
24.....	1.18	"	1.59	0.70	1.40	0.11	1.43	0.18
25.....	1.20	"	1.41	0.13	1.40	0.11	1.43	0.18
26.....	1.21	"	1.36	0.05	1.40	0.11	1.44	0.20
27.....	1.15	"	1.34	0.04	1.40	0.11	1.43	0.18
28.....	1.19	"	1.37	0.07	1.40	0.11	1.43	0.18
29.....	1.16	"	1.34	0.04	1.40	0.11	1.44	0.20
30.....	1.16	"	1.36	0.05	1.40	0.11	1.43	0.18
31.....	1.14	"	1.38	0.08			1.44	0.20

MONTHLY DISCHARGE of Bate Creek at Bate's Ranch, for 1914.

(Drainage area 12 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (15-30).....	2.40	0.96	1.32	0.110	0.065	42
May.....	0.83	0.15	0.34	0.029	0.033	21
June.....	1.28	0.11	0.27	0.023	0.026	16
July.....	0.08		0.02	0.002	0.002	1
August.....	0.70		0.04	0.004	0.005	3
September.....	1.02	0.04	0.17	0.014	0.016	10
October.....	0.56	0.13	0.20	0.016	0.018	12
The period.....					0.165	105

SNAKE CREEK NEAR VAL MARIE.

Location.—On SW. $\frac{1}{4}$ Sec. 16, Tp. 4, Rge. 13, W. 3rd Mer., about one-half mile east of Val Marie post office.

Records available.—April 7 to October 31, 1914.

Gauge.—Vertical staff, fastened to post on right bank; the elevation of the zero of the gauge in its present location has been 87.91 feet since establishment.

Bench-mark.—Permanent iron bench-mark, located three feet north of the east tower of the cable; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—Made from cable and by weir.

Observer.—Jean Denniel.

DISCHARGE MEASUREMENTS of Snake Creek near Val Marie, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 7.	E. W. W. Hughes.	15 2	33 7	1 19	3.05	40.00
April 19.	do	13.4	17.1	0 08	1.81	1.35
May 11.	do				1.14	0.32 ^a
May 18.	do				1.04	0.20 ^a
June 20.	do				0.52 ^b	0.24 ^a
June 21.	do				0.59	0.35 ^a
June 22.	do				0.60	0.33 ^a
June 23.	do				0.58	0.31 ^a
June 24.	do				0.52	0.22 ^a
July 11.	do				0.43	0.05 ^a
July 24.	do				0.34	Nil
Oct. 24.	do				0.54	0.26 ^a

^a Weir measurement.

^b Station moved upstream about one mile June 20.

DAILY GAUGE HEIGHT AND DISCHARGE of Snake Creek near Val Marie, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			1.20	0.40		
2.			1.16	0.34		
3.			1.16	0.34		
4.			1.14	0.31		
5.			1.13	0.30		
6.			1.12	0.28		
7.	3 03	40.00	1.20	0.40		
8.	2 70	29.00	1.24	0.46		
9.	3 67	60.00	1.19	0.38		
10.	6 41	146.00	1.16	0.34		
11.	6 78	158.00	1.14	0.31		
12.	5 16	107.00	^a			
13.	3 11	42.00	^a			
14.	1 98	6.70				
15.	2 31	17.10				
16.	3 59	57.00				
17.	2 49	23.00				
18.	1 93	5.20				
19.	1 81	1.58			^a	
20.	1 72	1.18			0.52 ^b	0.21
21.	1 66	1.09			0.56	0.28
22.	1 61	1.02			0.60	0.35
23.	1 58	0.97			0.58	0.31
24.	1 31	0.56			0.52	0.21
25.	1 31	0.56			0.60	0.35
26.	1 26	0.49			0.62	0.39
27.	1 23	0.44			0.67	0.48
28.	1 29	0.54			0.60	0.35
29.	1 26	0.49			0.60	0.35
30.	1 26	0.49			0.57	0.30
31.						

^a to ^a No observer.

^b Station moved about one mile upstream.

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DAILY GAUGE HEIGHT AND DISCHARGE of Snake Creek near Val Marie, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.55	0.26	Dry	Nil	0.42	0.04	0.54	0.24
2.....	0.51	0.19	"	"	0.41	0.03	0.53	0.22
3.....	0.50	0.17	"	"	0.39	0.02	0.53	0.22
4.....	0.49	0.15	"	"	0.39	0.02	0.57	0.30
5.....	0.49	0.15	"	"	0.38	0.01	0.62	0.39
6.....	0.47	0.12	"	"	0.37	0.01	0.64	0.42
7.....	0.45	0.08	"	"	0.37	0.01	0.65	0.44
8.....	0.42	0.04	"	"	0.39	0.02	0.66	0.45
9.....	0.42	0.04	"	"	0.45	0.08	0.67	0.48
10.....	0.42	0.04	"	"	0.45	0.08	0.66	0.46
11.....	0.46	0.10	"	"	0.44	0.07	0.66	0.46
12.....	0.44	0.07	"	"	0.44	0.07	0.66	0.46
13.....	0.42	0.04	"	"	0.62	0.39	0.62	0.39
14.....	0.39	0.02	"	"	0.68	0.49	0.58	0.31
15.....	0.38	0.01	"	"	0.66	0.46	0.57	0.30
16.....	0.37	0.01	"	"	0.64	0.42	0.57	0.30
17.....	0.35	Nil	"	"	0.60	0.35	0.57	0.30
18.....	0.35	"	"	"	0.59	0.33	0.58	0.31
19.....	0.35	"	"	"	0.58	0.31	0.60	0.35
20.....	0.35	"	"	"	0.59	0.33	0.61	0.37
21.....	0.36	"	"	"	0.58	0.31	0.52	0.21
22.....	0.34	"	"	"	0.59	0.33	0.54	0.24
23.....	Dry	"	"	"	0.57	0.30	0.52	0.21
24.....	"	"	0.40	0.02	0.57	0.30	0.54	0.24
25.....	"	"	0.45	0.08	0.55	0.26	0.54	0.24
26.....	"	"	0.41	0.03	0.54	0.24	0.54	0.24
27.....	"	"	0.40	0.02	0.54	0.24	0.52	0.21
28.....	"	"	0.40	0.02	0.53	0.22	0.55	0.26
29.....	"	"	0.40	0.02	0.53	0.22	0.55	0.26
30.....	"	"	0.39	0.02	0.54	0.24	0.54	0.24
31.....	"	"	0.43	0.06			0.55	0.26

MONTHLY DISCHARGE of Snake Creek near Val Marie, for 1914.

(Drainage area 188 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (7-30).....	158.00	0.44	29.10	0.15000	0.01300	1,388
May (1-11).....	0.46	0.28	0.35	0.00200	0.00080	8
June (20-30).....	0.48	0.21	0.32	0.00200	0.00070	7
July.....	0.26	Nil.	0.05	0.00020	0.00030	3
August.....	0.08	Nil.	0.01	0.00005	0.00006	1
September.....	0.49	0.01	0.21	0.00100	0.00100	12
October.....	0.48	0.21	0.32	0.00200	0.00200	19
The period.....					0.01786	1,438

BIGBREED CREEK NEAR BUZZARD'S RANCH.

Location.—On the SE. $\frac{1}{4}$ Sec. 15, Tp. 2, Rge. 11, W. 3rd Mer., near Coriander post office.*Records available.*—March 30 to October 31, 1914.*Gauge.*—Vertical staff, fastened to a post on the left bank about three miles from Mr. Buzzard's house; elevation of the zero of the gauge has been maintained at 92.13 feet since establishment.*Bench-mark.*—Permanent iron bench-mark, located on the left bank 36 feet from the gauge; assumed elevation, 100.00 feet.*Channel.*—Probably permanent.*Discharge measurements.*—Made with meter and weir.*Winter flow.*—This station is not maintained during the winter.*Observer.*—Geo. A. Brown and A. A. Hendrix.

DISCHARGE MEASUREMENTS of Bigbreed Creek near Buzzard's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 1.....	E. W. W. Hughes.....	26.3	40.4	0.99	3.19	40.00
April 2.....	do.....	19.8	26.6	1.28	2.45	35.00
April 26.....	do.....				0.98	0.87 ^a
May 4.....	do.....				0.89	0.31 ^a
May 21.....	do.....				0.85	0.06 ^a
June 10.....	do.....				0.34	Nil.
June 13.....	do.....	10.3	6.74	0.59	1.12	3.90
June 27.....	do.....				0.14	Nil.
July 3.....	do.....				0.60	"
July 28.....	do.....					"
Oct. 26.....	do.....					"

^a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bigbreed Creek near Buzzard's Ranch, for 1914

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.19	40.00	0.92	0.26	0.45	Nil.
2.....			2.66	36.00	0.92	0.26	0.36	"
3.....			2.55	35.00	0.96	0.64	0.33	"
4.....			2.14	33.00	0.96	0.64	0.32	"
5.....			2.18	33.00	0.95	0.50	0.32	"
6.....			2.16	33.00	0.95	0.50	0.33	"
7.....			2.14 ^a	33.00	0.95	0.50	0.31	"
8.....			1.61	25.00	0.94	0.42	0.30	"
9.....			1.40	14.80	0.94	0.42	0.30	"
10.....			1.35	12.60	0.93	0.34	0.30	"
11.....			1.20	6.40	1.08	2.80	0.31	"
12.....			1.97	43.00	1.06	2.30	0.31	"
13.....			1.97	43.00	0.93	0.34	1.14	4.50
14.....			2.37	63.00	0.93	0.34	1.18	5.80
15.....			1.45	17.10	0.94	0.42	1.09	3.00
16.....			1.36	13.00	0.94	0.42	1.30	10.40
17.....			1.36	13.00	0.88	0.08	1.19	6.10
18.....			1.20	6.40	0.85	0.05	1.05	2.10
19.....			1.10	3.20	0.88	0.08	1.00	1.20
20.....			1.12	3.80	0.85	0.05	0.98	0.92
21.....			1.07	2.50	0.83	0.03	0.96	0.64
22.....			0.99	1.06	0.84	0.04	1.16	5.10
23.....			0.97	0.78	0.83	0.03	0.90	0.10
24.....			0.96	0.64	0.79	Nil.	0.83	0.03
25.....			0.99	1.06	0.75	"	0.88	0.08
26.....			0.98	0.92	0.68	"	0.97	0.78
27.....			0.94	0.42	0.66	"	1.09	3.00
28.....			0.95	0.50	0.62	"	1.12	3.80
29.....			0.94	0.42	0.59	"	1.10	3.20
30.....			0.93	0.34	0.58	"	0.90	0.10
31.....	1.05 ^c	25						
	2.01	32			0.47			

^a to ^a Gauge height affected by ice.

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DAILY GAUGE HEIGHT AND DISCHARGE of Bigbreed Creek near Buzzard's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.78	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	0.70	"	"	"	"	"	"	"
3.....	0.69	"	"	"	"	"	"	"
4.....	0.65	"	"	"	"	"	"	"
5.....	0.80	"	"	"	"	"	"	"
6.....	0.72	"	"	"	"	"	"	"
7.....	0.64	"	"	"	"	"	0.55	"
8.....	0.57	"	"	"	"	"	0.60	"
9.....	0.48	"	"	"	"	"	0.45	"
10.....	0.44	"	"	"	"	"	Dry.	"
11.....	Dry.	"	"	"	"	"	"	"
12.....	"	"	"	"	"	"	"	"
13.....	"	"	"	"	"	"	"	"
14.....	"	"	"	"	"	"	"	"
15.....	"	"	"	"	"	"	"	"
16.....	"	"	"	"	"	"	"	"
17.....	"	"	"	"	"	"	"	"
18.....	"	"	"	"	"	"	"	"
19.....	"	"	"	"	"	"	"	"
20.....	"	"	"	"	"	"	"	"
21.....	"	"	"	"	"	"	"	"
22.....	"	"	"	"	"	"	"	"
23.....	"	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Bigbreed Creek near Buzzard's Ranch, for 1914.

(Drainage area 83 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (30-31).....	32.00	25.00	28.00	0.343	0.026	113
April.....	63.00	0.34	17.20	0.207	0.231	1,023
May.....	2.80	0.00	0.37	0.004	0.005	23
June.....	10.40	0.00	1.70	0.020	0.020	101
July.....						Nil.
August.....						"
September.....						"
October.....						"
The period.....					0.282	1,260

FRENCHMAN RIVER AT BUZZARD'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 3, Tp. 2, Rge. 11, W. 3rd Mer., at Wm. Buzzard's ranch, near Coriander post office.

Records available.—March 27, 1914, to October 31, 1914.

Gauge.—Vertical staff, fastened to post on left bank about one-half mile upstream from Mr. Buzzard's house; the elevation of the zero of the gauge is 87.50 feet.

Bench-mark.—Permanent iron bench-mark, located about two feet west of the sill of the north tower of the cable; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made by wading, or from cable.

Winter flow.—Station not maintained during winter.

Observer.—Geo. A. Brown, and A. Hendrix.

DISCHARGE MEASUREMENTS of Frenchman River at Buzzard's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>S$\frac{1}{2}$-ft.</i>
Mar. 28.....	E. W. W. Hughes.....	43.5	39.0	1.73	1.36	68.0 ^a
April 1.....	do.....	46.0	77.1	1.52	2.18	117.0 ^a
April 1.....	do.....	47.9	92.8	1.54	2.54	139.0 ^a
April 2.....	do.....	46.6	72.7	1.80	2.30	131.0 ^a
April 26.....	do.....	44.0	38.1	2.88	1.05	110.0
May 4.....	do.....	45.9	53.1	1.33	0.88	71.0
May 20.....	do.....	44.8	41.0	1.19	0.79	49.0
June 8.....	do.....	44.2	32.8	0.58	0.60	18.9
June 10.....	do.....	43.5	35.8	0.60	0.61	22.0
June 13.....	do.....	50.0	106.4	3.27	2.48	348.0
June 27.....	do.....	45.1	37.4	0.60	0.60	19.0
July 3.....	do.....	45.1	39.3	0.40	0.69	15.6
July 28.....	do.....	.....	.....	.....	0.10	0.3 ^b
October 26.....	do.....	41.0	30.0	0.60	0.54	17.4

^a Ice conditions.

^b Discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at Buzzard's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.36	128	0.94	76	0.57	20	.....	.....
2.....	2.32	131	0.93	74	0.56	19	.....	.....
3.....	2.62	146	0.90	69	0.55	18	.....	.....
4.....	3.38	515	0.85	60	0.55	18	.....	.....
5.....	4.34	688	0.85	60	0.56	19	.....	.....
6.....	5.78	947	0.85	60	0.56	19	.....	.....
7.....	7.03	1,172	0.84	58	0.67	32	.....	.....
8.....	4.45	708	0.82	55	0.64	28	.....	.....
9.....	3.93	614	0.81	53	0.60	23	.....	.....
10.....	4.72	757	0.80	51	0.61	24	.....	.....
11.....	6.04	994	0.82	55	0.64	28	.....	.....
12.....	6.15	1,014	0.83	56	0.68	33	.....	.....
13.....	5.45	888	0.84	58	2.70	393	.....	.....
14.....	5.33	866 ^a	0.84	58	2.00	267	.....	.....
15.....	3.17	478	0.86	62	0.59	67	.....	.....
16.....	4.95	798	0.91	71	0.74	42	.....	.....
17.....	6.03	992	0.90	69	0.72	39	.....	.....
18.....	4.46	710	0.85	60	0.70	36	.....	.....
19.....	3.72	577	0.85	60	0.69	35	.....	.....
20.....	3.07	460	0.79	49	0.64	28	.....	.....
21.....	2.57	370	0.78	48	0.63	27	.....	.....
22.....	2.04	274	0.75	43	0.61	24	.....	.....
23.....	1.73	218	0.74	42	0.59	22	.....	.....
24.....	1.82	235	0.71	37	0.58	21	.....	.....
25.....	1.67	208	0.67	32	0.68	33	.....	.....
26.....	1.05	96	0.67	32	0.85	60	.....	.....
27.....	1.81	95 ^a	1.00	87	0.60	23	.....	.....
28.....	1.28	68	0.95	78	0.59	22	.....	.....
29.....	0.98	44	0.95	78	0.61	24
30.....	1.14	53	0.94	76	0.60	23
31.....	1.88	97	0.59	22

^a March 27 to April 14—ice conditions.

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DAILY GAUGE HEIGHT AND DISCHARGE of Frenchman River at Buzzard's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.55 ^a	18.00	0.16	0.55	0.11	0.34	0.39	6.1
2.....	0.55 ^a	18.00	0.26	1.70	0.01	0.03	0.37	5.3
3.....	0.54 ^a	17.10	0.26	1.70	0.01	0.03	0.35	4.5
4.....	0.54 ^a	17.10	0.21	0.90	0.01	0.03	0.32	3.3
5.....	0.53	16.20	0.15	0.50	0.01	0.03	0.30	2.5
6.....	0.53	16.20	0.10	0.30	0.01	0.03	0.69	35.0
7.....	0.52	15.30	0.01	0.03	0.01	0.03	0.84	58.0
8.....	0.50	13.50	0.02	0.06	0.01	0.03	0.80	51.0
9.....	0.49	12.70	Dry	Nil	0.01	0.03	0.70	36.0
10.....	0.43	8.30	"	"	Dry	Nil	0.73	40.0
11.....	0.41	7.10	"	"	"	"	0.75	43.0
12.....	0.40	6.50	"	"	"	"	0.80	51.0
13.....	0.39	6.10	"	"	"	"	0.81	53.0
14.....	0.36	4.90	"	"	0.82	55.00	0.79	49.0
15.....	0.34	4.10	"	"	0.42	7.70	0.76	45.0
16.....	0.33	3.70	"	"	0.30	2.50	0.75	43.0
17.....	0.31	2.90	"	"	0.20	0.75	0.75	43.0
18.....	0.30	2.50	"	"	0.17	0.60	0.72	39.0
19.....	0.28	2.10	"	"	0.15	0.50	0.70	36.0
20.....	0.26	1.70	"	"	0.10	0.30	0.70	36.0
21.....	0.24	1.35	"	"	0.02	0.06	0.69	35.0
22.....	0.23	1.20	"	"	0.10	0.30	0.67	32.0
23.....	0.17	0.60	"	"	0.13	0.42	0.65	29.0
24.....	0.11	0.34	"	"	0.60	23.00	0.62	25.0
25.....	0.10	0.30	0.72	39.00	0.55	18.00	0.58	21.0
26.....	0.10	0.30	0.54	17.10	0.53	16.20	0.56	19.0
27.....	0.10	0.30	0.72	39.00	0.50	13.50	0.54	17.1
28.....	0.11	0.34	0.35	4.50	0.47	11.10	0.54	17.1
29.....	0.10	0.30	0.32	3.30	0.43	8.30	0.53	16.2
30.....	0.10	0.30	0.30	2.50	0.41	7.10	0.53	16.2
31.....	0.11	0.34	0.20	0.75	.....	.....	0.52	15.3

^a Gauge height interpolated.

MONTHLY DISCHARGE of Frenchman River at Buzzard's Ranch, for 1914.

(Drainage area 1,778 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (27-31).....	97	44.00	71.0	0.040	0.007	708
April.....	1,172	76.00	510.0	0.287	0.320	30,347
May.....	76	22.00	51.0	0.028	0.032	3,124
June.....	393	18.00	49.0	0.027	0.030	2,892
July.....	18	0.30	6.4	0.004	0.005	396
August.....	39	0.00	3.6	0.002	0.002	222
September.....	55	0.00	5.5	0.003	0.003	329
October.....	58	2.50	30.0	0.017	0.020	1,833
The period.....	.....	.....	.....	.....	0.419	39,851

LITTLEBREED CREEK NEAR BUZZARD'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 11, Tp. 2, Rge. 11, W. 3rd Mer., near Coriander post office.

Records available.—March 28 to October 31, 1914.

Gauge.—Vertical staff, fastened to post on right bank about two miles from Mr. Buzzard's house; elevation of the zero of the gauge has been 92.82 feet since establishment.

Bench-mark.—Permanent iron bench-mark, located on the left bank about 60 feet from the gauge; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made by meter, and by weir at low stages.

Winter flow.—This station is not maintained during the winter.

Artificial control.—Mr. Buzzard has a dam about one mile below this station, but the flow at the gauge is not affected by this structure.

Observer.—Geo. A. Brown and A. A. Hendrix.

DISCHARGE MEASUREMENTS of Littlebreed Creek near Buzzard's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 31.....	E. W. W. Hughes.....	7.5	3.17	0.25	1.23	0.80
Mar. 31.....	do.....	12.0	11.20	0.64	1.84	7.20
April 1.....	do.....	19.0	34.60	0.55	3.36	18.70
April 2.....	do.....	130.0	157.00	0.47	4.52	74.00
April 26.....	do.....				0.38	0.02 ^a
May 4.....	do.....					Nil
May 20.....	do.....					"
June 8.....	do.....					"
June 13.....	do.....	12.8	13.20	0.46	1.82	6.10
June 27.....	do.....	5.5	2.63	0.28	0.63	0.74
July 3.....	do.....					Nil
July 28.....	do.....					"
Oct. 26.....	do.....					"

^a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Littlebreed Creek near Buzzard's Ranch, for 9114.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.16 ^a	18.70	Dry	Nil	Dry	Nil
2.....			4.32	74.00	"	"	"	"
3.....			3.95	54.00	"	"	"	"
4.....			3.57	41.00	"	"	"	"
5.....			3.23	30.00	"	"	"	"
6.....			3.53	39.00	"	"	"	"
7.....			2.36	12.50	"	"	"	"
8.....			2.00	8.30	"	"	"	"
9.....			1.45	4.00	"	"	"	"
10.....			1.19	2.70	"	"	"	"
11.....			1.08	2.20	"	"	"	"
12.....			1.29	3.10	"	"	"	"
13.....			1.30	3.20	"	"	1.91	7.40
14.....			2.31	11.80	"	"	3.08	26.00
15.....			2.51	14.80	"	"	1.21	2.70
16.....			2.35	12.40	"	"	1.56	4.70
17.....			1.28	3.00	"	"	1.02	1.98
18.....			1.06	2.10	"	"	0.83	1.24
19.....			0.95	1.70	"	"	0.55	0.40
20.....			1.04	2.10	"	"	0.51	0.32
21.....			0.93	1.62	"	"	0.39	0.08
22.....			0.91	1.54	"	"	0.38	0.06
23.....			0.83	1.24	"	"	Dry	Nil
24.....			0.81	1.18	"	"	"	"
25.....			0.49	0.28	"	"	0.78	1.09
26.....			0.38	0.06	"	"	1.72	5.80
27.....			0.31	Nil	"	"	0.63	0.64
28.....	0.98 ^a	0.20	Dry	"	"	"	0.50	0.30
29.....	0.98	0.20	"	"	"	"	0.40	0.10
30.....	1.14	0.50	"	"	"	"	Dry	Nil
31.....	1.53	4.00			"	"		

^a to a Ice in channel.

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DAILY GAUGE HEIGHT AND DISCHARGE of Littlebreed Creek near Buzzard's Ranch, for 1914.
— *Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	Dry	Nil	Dry	Nil	Dry	Nil	Dry	Nil
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	"	"
5.....	"	"	"	"	"	"	"	"
6.....	"	"	"	"	"	"	"	"
7.....	"	"	"	"	"	"	1.85	6.80
8.....	"	"	"	"	"	"	1.51	4.40
9.....	"	"	"	"	"	"	0.75	1.00
10.....	"	"	"	"	"	"	0.70	0.85
11.....	"	"	"	"	"	"	0.80	1.15
12.....	"	"	"	"	"	"	Dry	Nil
13.....	"	"	"	"	"	"	"	"
14.....	"	"	"	"	"	"	"	"
15.....	"	"	"	"	"	"	"	"
16.....	"	"	"	"	0.85	1.30	"	"
17.....	"	"	"	"	0.50	0.30	"	"
18.....	"	"	"	"	Dry	Nil	"	"
19.....	"	"	"	"	"	"	"	"
20.....	"	"	"	"	"	"	"	"
21.....	"	"	"	"	"	"	"	"
22.....	"	"	"	"	"	"	"	"
23.....	"	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	0.89	1.46	"	"	"	"
26.....	"	"	0.65	0.70	"	"	"	"
27.....	"	"	Dry	Nil	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Littlebreed Creek near Buzzard's Ranch, for 1914.

(Drainage area 61 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (28-31).....	4.00	0.20	1.22	0.0200	0.001	10
April.....	74.00		11.70	0.1910	0.213	696
May.....	26.00		1.76	0.0290	0.032	Nil.
June.....						106
July.....						Nil.
August.....	1.46		0.07	0.0010	0.001	4
September.....	1.30		0.05	0.0009	0.001	3
October.....	6.80		0.46	0.0070	0.008	28
The period.....					0.256	847

McEachran Creek at McCoy's Ranch.

Location.—On the SW. $\frac{1}{4}$ Sec. 6, Tp. 1, Rge. 7, W. 3rd Mer., about 50 feet north of Mr. McCoy's house.

Records available.—May 1 to October 31, 1914.

Gauge.—Staff gauge, fastened to a post in the right bank; elevation of the zero of the gauge has been maintained at 89.50 feet since establishment.

Bench-mark.—Permanent iron bench-mark, located 32 feet southeast of the gauge; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made with meter, and by weir at low stages.

Winter flow.—Station not maintained during the winter.

Diversions.—There is no diversion from this stream.

Observer.—Donald McCoy.

DISCHARGE MEASUREMENTS of McEachran Creek at McCoy's Ranch, in 1914.

Date.		Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May	1.....	E. W. W. Hughes.....	.....	.....	.....	0.60	0.54 _a
June	30.....	do.....	.....	.....	.....	0.29	....._b
July	1.....	do.....	.....	.....	.....	0.28	....._b

a Weir measurement.

b Flow too small to measure.

DAILY GAUGE HEIGHT AND DISCHARGE of McEachran Creek at McCoy's Ranch, for 1914.

DAY.	May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.60	0.54	0.25	0.01	0.28	0.02
2.....	0.60	0.54	0.25	0.01	0.28	0.02
3.....	0.60	0.54	0.25	0.01	0.25	0.01
4.....	0.55	0.37	0.32	0.03	0.25	0.01
5.....	0.55	0.37	0.35	0.04	0.25	0.01
6.....	0.50	0.24	0.35	0.04	0.25	0.01
7.....	0.50	0.24	0.35	0.04	0.25	0.01
8.....	0.50	0.24	0.30	0.02	0.25	0.01
9.....	0.50	0.24	0.30	0.02	0.25	0.01
10.....	0.50	0.24	0.30	0.02	0.20	Nil. ^a
11.....	0.50	0.24	0.30	0.02	0.20	"
12.....	0.50	0.24	0.35	0.04	0.20	"
13.....	0.50	0.24	0.40	0.08	0.20	"
14.....	0.50	0.24	0.40	0.08	0.20	"
15.....	0.50	0.24	0.40	0.08	0.10	"
16.....	0.45	0.13	0.40	0.08	0.10	"
17.....	0.45	0.13	0.35	0.04	Dry.	"
18.....	0.45	0.13	0.35	0.04	"	"
19.....	0.45	0.13	0.35	0.04	"	"
20.....	0.45	0.13	0.35	0.04	"	"
21.....	0.45	0.13	0.35	0.04	"	"
22.....	0.45	0.13	0.30	0.02	"	"
23.....	0.45	0.13	0.30	0.02	"	"
24.....	0.40	0.08	0.30	0.02	"	"
25.....	0.40	0.08	0.30	0.02	"	"
26.....	0.35	0.04	0.30	0.02	"	"
27.....	0.35	0.04	0.30	0.02	"	"
28.....	0.30	0.02	0.30	0.02	"	"
29.....	0.30	0.02	0.30	0.02	"	"
30.....	0.25	0.01	0.29	0.02	"	"
31.....	0.25	0.01	"	"

^a Stream dry from July 10 to Oct. 31.

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MONTHLY DISCHARGE of McEachran Creek at McCoy's Ranch, for 1914.

(Drainage area 107 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May.....	0.54	0.01	0.200	0.00200	0.00200	12.0
June.....	0.08	0.01	0.030	0.00030	0.00030	2.0
July.....	0.02	0.00	0.004	0.00003	0.00003	0.2
The period.....					0.00233	14.2

HORSE CREEK NEAR BARNARD, MONTANA, U.S.A.

Location.—About one mile north of Barnard post office, on United States unsurveyed land, and about one-quarter mile south of the international boundary.

Records available.—May 1 to October 31, 1914.

Gauge.—Staff gauge, fastened to a post on the right bank; the elevation of the zero of the gauge has been maintained at 92.54 feet since establishment.

Bench-mark.—Wooden plug, driven in the left bank 30 feet from the gauge; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made by wading, with meter, and by weir at low stages.

Winter flow.—This station is not maintained during the winter.

Observer.—W. J. Harris.

DISCHARGE MEASUREMENTS of Horse Creek near Barnard, Montana, U.S.A., in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 1.....	E. W. W. Hughes.....	4.9	1.38	0.46	0.64	0.63
June 30.....	do.....				0.50	0.28 _a
July 1.....	do.....				0.45	0.22 _a

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Horse Creek near Barnard, Montana, U.S.A., for 1914.

DAY.	May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.66	0.69	0.40	0.14	0.46	0.23
2.....	0.62	0.57	0.40	0.14	0.46	0.23
3.....	0.54	0.37	0.40	0.14	0.46	0.23
4.....	0.46	0.23	0.40	0.14	0.45	0.21
5.....	0.52	0.33	0.56	0.41	0.44	0.20
6.....	0.53	0.35	0.56	0.41	0.42	0.17
7.....	0.53	0.35	0.55	0.39	0.40	0.14
8.....	0.58	0.46	0.54	0.37	0.37	0.11
9.....	0.52	0.33	0.54	0.37	0.35	0.09
10.....	0.52	0.33	0.52	0.33	0.34	0.08
11.....	0.54	0.37	0.51	0.31	0.32	0.07
12.....	0.54	0.37	0.67	0.73	0.31	0.06
13.....	0.53	0.35	0.67	0.73	0.31	0.06
14.....	0.52	0.33	0.67	0.73	0.40	0.14 ^b
15.....	0.52	0.33	0.67	0.73	Dry.	Nil.
16.....	0.51	0.31	0.94	1.66	"	"
17.....	0.51	0.31	0.59	0.49	"	"
18.....	0.54	0.37	0.56	0.41	"	"
19.....	0.57	0.44	0.54	0.37	"	"
20.....	0.52	0.33	0.54	0.37	"	"
21.....	0.50	0.29	0.52	0.33	"	"
22.....	0.48	0.26	0.52	0.33	"	"
23.....	0.48	0.26	0.50	0.29	"	"
24.....	0.48	0.26	0.50	0.29	"	"
25.....	0.48	0.26	0.54	0.37	"	"
26.....	0.46	0.23	0.56	0.41	"	"
27.....	0.44	0.20	0.56	0.41	"	"
28.....	0.44	0.20	0.60	0.51	"	"
29.....	0.42	0.17	0.55 ^a	0.39	"	"
30.....	0.42	0.17	0.50	0.29	"	"
31.....	0.40	0.14			"	^b

^a Gauge height interpolated.^b Stream dry from July 14 to Oct. 31.

MONTHLY DISCHARGE of Horse Creek near Barnard, Montana, U.S.A., for 1914.

(Drainage area 71 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May.....	0.60	0.14	0.32	0.0045	0.005	20
June.....	1.66	0.14	0.43	0.0061	0.007	26
July.....	0.23	0.00	0.06	0.0009	0.001	4
August.....						Nil.
September.....						"
October.....						"
The period.....					0.013	50

BOWREY DITCH FROM ROCK CREEK, MONTANA, U.S.A.

Location.—In United States unsurveyed territory, near Barnard, Montana.*Records available.*—June 1 to August 26, 1914.*Gauge.*—Vertical staff; elevation of zero 96.51 feet.*Bench-mark.*—Stake on left bank; assumed elevation, 100.00 feet.*Discharge measurements.*—By wading.*Observer.*—C. W. Bowrey.

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DISCHARGE MEASUREMENTS of Bowrey Ditch from Rock Creek, Montana, U.S.A., in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 30.....	E. W. W. Hughes.....					
June 30.....	do.....	5.5	2.13	0.25	0.70	Nil.
July 1.....	do.....	7.6	6.85	0.15	1.45	1.05

DAILY GAUGE HEIGHT AND DISCHARGE of Bowrey Ditch from Rock Creek, Montana, U.S.A. for 1914.

DAY.	June.		July.		August.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.29	0.94	1.45	1.06		
2.....	1.35	0.99	1.50	1.09		
3.....	1.45	1.06				
4.....	1.50	1.09				
5.....	1.50	1.09				
6.....	1.50	1.09				
7.....	1.40	1.02				
8.....	1.45	1.06				
9.....						
10.....						
11.....						
12.....						
13.....						
14.....						
15.....						
16.....						
17.....						
18.....						
19.....						
20.....						
21.....						
22.....						
23.....						
24.....						
25.....					1.70	1.23
26.....					1.20	0.89
27.....						
28.....						
29.....						
30.....	0.70	0.53				
31.....						

MONTHLY DISCHARGE of Bowrey Ditch from Rock Creek, Montana, U.S.A., for 1914.

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.
	Maximum.	Minimum.	Mean.	Total in Acre-feet.
June (1-8 and 30).....	1.09	0.00	0.98	18
July (1-2).....	1.09	0.00	1.08	4
August (25-26).....	1.23	0.00	1.06	4
The period.....				26

ROCK CREEK NEAR BARNARD, MONTANA, U.S.A.

Location.—On United States unsurveyed land, about one mile south of the international boundary.

Records available.—May 1 to October 31, 1914.

Gauge.—Vertical staff, fastened to a post on the right bank about one-half mile downstream from Mr. Bowrey's house; the elevation of the zero of the gauge has been maintained at 91.83 feet since establishment.

Bench-mark.—Permanent iron bench-mark, located 28 feet west of the gauge; assumed elevation, 100.00 feet.

Channel.—Probably permanent.

Discharge measurements.—Made by wading.

Winter flow.—Station not maintained during the winter.

Diversions.—Mr. Chas. Bowrey diverts water for irrigation purposes, about one-quarter mile above the gauge. Records of the discharge of this ditch appear elsewhere in this report, but are included in the monthly computations of this station.

Observer.—Chas. Bowrey.

DISCHARGE MEASUREMENTS of Rock Creek near Barnard, Montana, U.S.A., in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge
		Feet.	Sq. feet.	Ft. per sec.	Feet.	Sec.-ft.
April 30.....	E. W. W. Hughes.....	15 1	8 57	1 10	1 01	9 49
June 30.....	do.....	19 1	19 10	0 98	1 02	9 90
July 1.....	do.....	8 1	8 10	0 40	0 50	0 87

DAILY GAUGE HEIGHT AND DISCHARGE of Rock Creek near Barnard, Montana, U.S.A., for 1914.

DAY.	May.		June.		July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1 06	11 4	Dry. ^a	Nil.	0 50 ^a	0 85	Dry. ^a	Nil.	0 60	1 55	.....	0 50 ^c
2.....	1 06	11 4	" ^a	"	1 05 ^b	11 00	" ^a	"	.....	0 50 ^c	.....	0 50 ^c
3.....	1 06	11 4	" ^a	"	0 99	8 70	" ^a	"	.....	0 50 ^c	.....	0 50 ^c
4.....	1 05	11 0	" ^a	"	0 95	7 40	1 32 ^d	22 00	.....	0 50 ^c	.....	0 50 ^c
5.....	1 05	11 0	" ^a	"	0 94	7 10	1 12	13 80	.....	0 50 ^c	0 60	1 55
6.....	1 04	10 6	" ^a	"	0 94	7 10	0 90	6 10	.....	0 50 ^c	0 85	5 00
7.....	1 04	10 6	" ^a	"	.....	7 10 ^c	0 65	2 00	.....	0 50 ^c	0 95	7 40
8.....	1 04	10 6	" ^a	"	.....	7 10 ^c	0 65	2 00	.....	0 50 ^c	2 45	67 00
9.....	1 04	10 6	1 30 ^b	21 0	.....	7 10 ^c	.....	1 55 ^c	.....	0 50 ^c	1 65	35 00
10.....	1 04	10 6	1 20	17 0	.....	7 10 ^c	.....	1 15 ^c	.....	0 50 ^c	.....	26 00 ^c
11.....	1 04	10 6	1 10	13 0	.....	7 10 ^c	.....	1 00 ^c	.....	0 50 ^c	.....	20 00 ^c
12.....	1 04	10 0	1 07	11 8	1 96	47 00	.....	0 85 ^c	.....	0 50 ^c	.....	15 00 ^c
13.....	1 04	10 6	1 05	11 0	1 90	45 00	.....	0 50 ^c	.....	0 50 ^c	1 05	11 00
14.....	1 04	10 6	1 00	9 0	1 30	21 00	.....	0 50 ^c	.....	0 50 ^c	1 00	9 00
15.....	1 03	10 2	1 00	9 0	1 03	10 20	.....	0 50 ^c	0 70	2 50	0 90	6 10
16.....	1 02	9 8	1 03	10 2	1 03	10 20	.....	0 50 ^c	0 60	1 55	0 85	5 00
17.....	1 02	9 8	1 03	10 2	1 03	10 20	.....	0 50 ^c	0 60	1 55	.....	4 50 ^c
18.....	1 04	10 6	1 00	9 0	1 03	10 20	.....	0 50 ^c	0 60	1 55	.....	4 00 ^c
19.....	1 04	10 6	0 98	8 4	Dry. ^a	Nil.	.....	0 50 ^c	0 55	1 15	0 75	3 20
20.....	1 04	10 6	0 99	8 7	" ^a	"	.....	0 50 ^c	0 55	1 15	0 70	2 50
21.....	Dry. ^a	Nil.	1 00	9 0	" ^a	"	.....	0 50 ^c	0 55	1 15	0 97	8 00
22.....	1 04 ^d	10 6	1 02	9 8	" ^a	"	.....	0 50 ^c	0 55	1 15	0 70	2 50
23.....	.....	10 6 ^c	1 00	9 0	" ^a	"	.....	0 50 ^c	0 55	1 15	0 70	2 50
24.....	.....	10 6 ^c	1 00	9 0	" ^a	"	.....	0 50 ^c	.....	0 50 ^c	0 70	2 50
25.....	.....	10 6 ^c	1 02	9 8	" ^a	"	1 30	21 00	.....	0 50 ^c	0 70	2 50
26.....	.....	10 6 ^c	1 00	9 0	" ^a	"	1 30	21 00	.....	0 50 ^c	.....	2 50 ^c
27.....	.....	10 6 ^c	0 95	7 4	" ^a	"	1 15	15 00	.....	0 50 ^c	.....	2 50 ^c
28.....	Dry. ^a	Nil.	0 96	7 7	" ^a	"	1 05	11 00	.....	0 50 ^c	.....	2 50 ^c
29.....	" ^a	"	0 90	6 1	" ^a	"	0 85	5 00	.....	0 50 ^c	.....	2 50 ^c
30.....	" ^a	"	1 00	9 0	" ^a	"	0 80	4 00	.....	0 50 ^c	0 70	2 50
31.....	" ^a	"	.....	.....	"^a	"	0 65	2 00	.....	.....	.....	2 50 ^c

^a Sluice in dam closed, reservoir filling.

^b Dam broke.

^c Discharge estimated.

^d Sluice in dam opened.

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MONTHLY DISCHARGE of Rock Creek near Barnard, Montana, U.S.A., for 1914.

(Drainage area 230 square miles).

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
May	11.4	0.60	8.90	0.039	0.045	549
June	21.0	0.94	7.80	0.034	0.038	462
July	47.0	0.00	7.60	0.033	0.038	463
August	22.0	0.00	4.40	0.019	0.022	273
September	2.5	0.50	0.85	0.004	0.004	51
October	67.0	0.50	8.30	0.036	0.042	510
The period					1.89	2,308

NOTE.—This table includes discharge of Bowrey Ditch.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Frenchman River drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
March 17.	M. H. French.	Backtail Creek	39-6-23-3.				Nil.
June 27.	F. R. Steinberger	do	do				"
March 17.	M. H. French.	Concrete Coulee	2-7-23-3.				"
April 7.	F. R. Steinberger	do	do	7.10	3.04	0.70	2.29
June 26.	do	do	do				0.13
Aug. 7.	do	do	do				0.13
June 20.	do	Calf Creek	SE. 5-8-22-3.				0.14
Sept. 14.	E. W. W. Hughes	do	do	8.00	3.25	0.90	2.90
May 7.	F. R. Steinberger	Doyle Coulee	SE. 17-7-22-3.				0.22
June 26.	do	do	do				0.16
July 20.	do	do	do				0.09
Aug. 7.	do	do	do				0.08
March 25.	M. H. French.	Frenchman River.	25-6-22-3.	38.03	39.03	0.92	28.00
March 31.	do	do	do	41.00	32.43	1.34	44.00
April 1.	do	do	do	44.00	37.24	1.29	45.00
April 3.	do	do	do	55.00	67.00	2.51	168.00
April 3.	do	do	do	45.00	48.30	1.95	94.00
April 4.	do	do	do	55.00	93.49	2.55	238.00
April 5.	do	do	do	58.00	102.09	3.89	399.00
April 6.	do	do	do	108.00	113.00	4.08	463.00
April 11.	do	do	do	56.00	80.80	3.27	265.00
April 14.	do	do	do	53.90	75.60	3.43	259.00
May 9.	F. R. Steinberger	Overflow of Cypress Lake	SE. 24-6-25-3.				0.72
June 29.	do	do	do				0.14
July 22.	do	do	do				Nil.
Aug. 12.	do	do	do				"
June 26.	do	Pearse Ditch	2-7-21-3.				1.26
May 7.	do	Petrified Coulee	7-7-22-3.				0.62
June 26.	do	do	do				0.14
July 20.	do	do	do				0.11
Aug. 7.	do	do	do				0.05

SWIFTCURRENT CREEK DRAINAGE BASIN.

General Description.

Swiftcurrent Creek rises in the eastern slope of the Cypress Hills, follows a northeasterly course for 75 miles, and then a northerly one for about 25 miles, and finally empties into the South Saskatchewan River in Township 20, Range 13, West of the 3rd Meridian.

The only important tributary is Bone Creek, which rises in the Cypress Hills and joins the Swiftcurrent in Township 10, Range 19, West of the 3rd Meridian.

The main stream flows through a valley, 200 to 300 feet deep and a mile wide, to within a few miles of its mouth, where it enters a sandstone gorge about 500 feet deep.

The bench land above the creek is of rolling prairie, broken by innumerable coulees. The soil is a sandy loam. There is very little tree growth along the stream.

The mean annual rainfall at the town of Swift Current is about 15 inches. This increases slightly at the stream's headwaters. The greatest precipitation occurs during the months of May, June, and July. From November to April the stream is frozen over.

There are a number of small irrigation ditches in this drainage basin, and the town of Swift Current and the Canadian Pacific Railway Company take water for domestic and industrial purposes from the creek.

SWIFTCURRENT CREEK AT POLLOCK'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 22, Tp. 7, Rge. 21, W. 3rd Mer.

Records available.—May 18, 1909, to October 31, 1914. Two discharge measurements in 1908.

Gauge.—Vertical staff; elevation of zero, 1909-12, maintained at 89.25 feet; 1913-14, maintained at 88.75 feet.

Bench-mark.—Permanent iron bench-mark.

Channel.—Sand and gravel.

Discharge measurements.—At high stages by wading; permanent three-foot weir installed in 1914 for measuring the ordinary flow.

Winter flow.—Station not maintained during the winter.

Observer.—D. H. Pollock.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek at Pollock's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 4.....	M. H. French.....	5.2	2.08	1.69	4.35	3.50
April 15.....	do	7.0	4.50	0.95	1.85	4.30
April 17.....	do	3.0	3.05	0.82	1.65	2.50
April 30.....	F. R. Steinberger.....	6.3	2.05	0.91	1.39	1.88
May 20.....	do				1.30	1.45a
June 24.....	do				1.13	0.61a
July 9.....	do				1.11	0.43a
Aug. 6.....	do				1.18	0.66a
Aug. 14.....	E. W. W. Hughes.....				1.24	0.75a
Sept. 10.....	do				1.31	0.83a
Sept. 16.....	do				1.47	1.44a

a Weir measurement.

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DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Pollock's Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	4.52	3.00 ^b	1.42	1.95	1.04	0.74
2.....	4.52	3.00	1.42	1.95	1.05	0.75
3.....	4.50	3.20	1.41	1.90	1.40	1.65
4.....	4.50	3.50	1.44	2.00	1.38	1.59
5.....	4.30	3.60	1.50	2.30	1.30	1.30
6.....	3.50	3.70	1.44	2.00	1.30	1.30
7.....	2.50	3.80	1.44	2.00	1.09	0.70
8.....	2.40	3.90	1.42	1.95	1.10	0.82
9.....	2.40	4.00	1.42	1.95	1.07	0.78
10.....	2.30	4.30	1.45	2.10	1.30	1.25
11.....	1.88	4.60 ^b	1.42	1.95	1.22	1.00
12.....	1.87 ^a	4.50	1.40	1.86	1.22	0.99
13.....	1.86 ^a	4.40	1.40	1.86	1.55	2.00
14.....	1.85 ^a	4.30	1.35	1.69	1.40	1.45
15.....	1.85	4.30	1.30	1.52	1.30	1.14
16.....	1.75	3.40	1.34	1.66	1.25	1.00
17.....	1.65	2.50	1.30	1.52	1.20	0.87
18.....	1.64	2.50	1.35	1.69	1.18	0.82
19.....	1.59	2.40	1.30	1.48	1.15	0.70
20.....	1.55	2.20	1.30	1.45	1.15	0.69
21.....	1.56	2.30	1.30	1.45	1.19	0.77
22.....	1.59	2.40	1.30	1.45	1.15	0.64
23.....	1.56	2.30	1.30	1.45	1.15	0.63
24.....	1.52	2.20	1.35	1.60	1.15	0.61
25.....	1.46	1.99	1.30	1.42	1.15	0.61
26.....	1.45	1.98	1.10	0.90	1.15	0.61
27.....	1.45	2.00	1.08	0.85	1.15	0.60
28.....	1.44	1.98	1.05	0.78	1.15	0.60
29.....	1.43	1.95	1.05	0.78	1.15	0.60
30.....	1.42	1.90	1.05	0.76	1.15	0.60
31.....			1.04	0.74		

^a Gauge height interpolated.^b Ice conditions April 1 to 11; discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Swifteurrent Creek at Pollock's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.25	0.85	1.12	0.46	1.36	1.09	0.33	1.22
2.....	1.25	0.85	1.14	0.51	1.35	1.06	0.34	1.28
3.....	1.25	0.85	1.15	0.53	1.36	1.09	0.34	1.28
4.....	1.25	0.85	1.15	0.53	1.36	1.09	0.40	1.62
5.....	1.24	0.80	1.15	0.53	1.35	1.06	0.41	1.68
6.....	1.24	0.80	1.18	0.60	1.36	1.09	0.41	1.68
7.....	1.25	0.80	1.20	0.64	1.36	1.09	0.44	1.86
8.....	1.10	0.45	1.18	0.60	1.40	1.21	0.95	5.60
9.....	1.11	0.43	1.17	0.57	1.38	1.15	0.70	3.60
10.....	1.10	0.42	1.15	0.60	1.36	1.09	0.65	3.30
11.....	1.09	0.40	1.14	0.60	1.35	1.06	0.50	2.20
12.....	1.09	0.40	1.14	0.65	1.35	1.06	0.40	1.62
13.....	1.08	0.39	1.15	0.70	2.10	5.10	0.40	1.62
14.....	1.20	0.64	1.15	0.75	1.80	3.00	0.39	1.56
15.....	1.20	0.64	1.14	0.65	1.60	2.00	0.38	1.50
16.....	1.19	0.62	1.14	0.65	0.37 ^a	1.44	0.37	1.44
17.....	1.20	0.64	1.16	0.70	0.37	1.44	0.36	1.39
18.....	1.20	0.64	2.00	4.30	0.35	1.39	0.36	1.39
19.....	1.19	0.62	1.45	1.40	0.35	1.33	0.36	1.39
20.....	1.20	0.64	1.40	1.21	0.34	1.28	0.36	1.39
21.....	1.19	0.62	1.38	1.15	0.33	1.22	0.37	1.44
22.....	1.18	0.60	1.37	1.12	0.33	1.22	0.37	1.44
23.....	1.17	0.57	1.40	1.21	0.33	1.22	0.37	1.44
24.....	1.15	0.53	2.10	5.10	0.33	1.22	0.37	1.44
25.....	1.15	0.53	2.00	4.30	0.33	1.22	0.37	1.44
26.....	1.14	0.51	1.80	3.00	0.33	1.22	0.37	1.44
27.....	1.12	0.46	1.38	1.15	0.32	1.17	0.37	1.44
28.....	1.12	0.46	1.35	1.06	0.32	1.17	0.37	1.44
29.....	1.12	0.46	1.35	1.06	0.32	1.17	0.37	1.44
30.....	1.12	0.46	1.36	1.09	0.32	1.17	0.37	1.44
31.....	1.14	0.51	1.36	1.09			0.37 ^a	1.44

^a Gauge heights, Sept. 16 to Oct. 31, are heads on 21-inch weir.

MONTHLY DISCHARGE of Swifteurrent Creek at Pollock's Ranch, for 1914.

(Drainage area 16 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	4.60	1.90	3.070	0.192	0.21	183
May.....	2.30	0.74	1.580	0.099	0.11	97
June.....	2.00	0.60	0.937	0.058	0.06	55
July.....	0.85	0.39	0.595	0.037	0.04	37
August.....	5.10	0.46	1.240	0.077	0.09	76
September.....	5.10	1.06	1.400	0.087	0.10	83
October.....	5.60	1.22	1.760	0.110	0.13	108
The period.....					0.74	639

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AXTON DITCH FROM SWIFTCURRENT CREEK.

Location.—On the NE. $\frac{1}{4}$ Sec. 26, Tp. 7, Rge. 21, W. 3rd Mer., near South Fork post office.

Records available.—Gauge heights for the period June 10 to July 9, 1914.

Observer.—J. W. E. Axton.

Remarks.—Not sufficient data are available to compute daily discharges.

DAILY GAUGE HEIGHT of Axton Ditch from Swiftcurrent Creek, for 1914.

DAY.	June.		July.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			0.60	
2.....			0.58	
3.....			0.58	
4.....			0.58	
5.....			0.56	
6.....			0.56	
7.....			0.56	
8.....				
9.....	0.54		0.48	
10.....	0.54			
11.....	0.54			
12.....	0.52			
13.....	0.50			
14.....	0.50			
15.....	0.50			
16.....				
17.....				
18.....				
19.....				
20.....				
21.....				
22.....				
23.....				
24.....				
25.....	0.75			
26.....	0.75			
27.....	0.73			
28.....	0.71			
29.....	0.67			
30.....	0.65			
31.....				

JONES CREEK AT STEARNS' RANCH.

Location.—On SE. $\frac{1}{4}$ Sec. 20, Tp. 8, Rge. 20, W. 3rd Mer.

Records available.—May 15, 1912, to October 31, 1914.

Gauge.—Vertical staff; elevation 93.14 feet since establishment

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100 00 feet.

Channel.—Composed of clay and sand.

Discharge measurements.—Made by wading or with a weir.

Winter flow.—Station not maintained during winter.

Observer.—C. E. Stearns.

DISCHARGE MEASUREMENTS of Jones Creek at Stearns' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 31	M. H. French				2.84	Nil.
April 15	do	4.7	6.55	1.03	2.07	6.70
April 30	F. R. Steinberger	4.4	1.65	1.24	0.75	2.00
May 20	do	3.9	1.15	1.57	0.62	1.81
June 21	do				0.51	0.29 _a
July 11	do				0.45	0.22 _a
Aug. 6	do				Dry.	Nil.
Sept. 10	E. W. W. Hughes				0.50	0.40 _a

_a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Jones Creek at Stearns' Ranch, for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1	4.32	16.2	0.72	1.94	0.42	0.66
2	4.80	18.2	0.72	1.95	0.40	0.58
3	3.92	14.5	0.72	1.96	0.62	1.40
4	3.71 _a	13.6	0.74 _a	2.10	0.73	1.83
5	3.50	12.8	0.77	2.20	0.89	2.50
6	3.61	13.2	0.79	2.30	0.82 _a	2.20
7	3.39 _a	12.3	0.74	2.10	0.75 _a	1.82
8	3.17	11.4	0.71	2.00	0.62	1.26
9	2.67	9.3	0.71 _a	2.00	0.59	1.11
10	2.17	7.2	0.70	1.99	0.56	0.96
11	2.35	7.9	0.69	1.97	0.57	0.98
12	2.44	8.3	0.67	1.90	0.70	1.48
13	2.30	7.7	0.65	1.82	0.92	2.40
14	2.32	7.8	0.64	1.80	0.94	2.40
15	1.97	6.3	0.62	1.74	0.78 _a	1.72
16	1.72	5.3	0.62	1.75	0.62	1.02
17	1.37	3.9	0.62 _a	1.76	0.58 _a	0.82
18	1.17	3.1	0.62	1.78	0.55	0.66
19	1.14 _a	3.1	0.62	1.79	0.53 _a	0.56
20	1.12	3.1	0.62	1.80	0.52	0.50
21	1.02	2.7	0.62	1.78	0.57	0.60
22	0.96 _a	2.5	0.61	1.72	0.54 _a	0.46
23	0.92	2.4	0.62 _a	1.72	0.51	0.34
24	0.87	2.2	0.64	1.78	0.58 _a	0.48
25	0.84	2.2	0.62	1.68	0.65 _a	0.84
26	0.83 _a	2.2	0.60 _a	1.56	0.72	1.12
27	0.82	2.2	0.58	1.46	0.65	0.84
28	0.80	2.1	0.55	1.30	0.63 _a	0.76
29	0.77	2.1	0.54 _a	1.24	0.61	0.68
30	0.76	2.1	0.53	1.16	0.58	0.57
31			0.47 _a	0.88		

_a Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Jones Creek at Stearns' Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.56 ^a	0.51	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	0.53 ^a	0.42	"	"	"	"	"	"
3.....	0.51	0.37	"	"	"	"	"	"
4.....	0.51	0.37	"	"	"	"	"	"
5.....	0.48	0.29	"	"	"	"	"	"
6.....	0.50	0.34	"	"	"	"	"	"
7.....	0.48 ^a	0.29	"	"	"	"	"	"
8.....	0.47	0.27	"	"	"	"	"	"
9.....	0.45	0.22	"	"	"	"	"	"
10.....	0.45 ^a	0.22	"	"	"	"	"	"
11.....	0.45	0.22	"	"	"	"	"	"
12.....	0.40 ^a	0.14	"	"	"	"	"	"
13.....	0.36	0.09	"	"	"	"	"	"
14.....	0.32	0.04	"	"	"	"	"	"
15.....	0.32 ^a	0.04	"	"	"	"	"	"
16.....	0.31 ^a	0.03	"	"	"	"	"	"
17.....	0.31	0.03	"	"	"	"	"	"
18.....	0.30	0.02	"	"	"	"	"	"
19.....	0.28 ^a	0.01	"	"	"	"	"	"
20.....	0.26 ^a	Nil.	"	"	"	"	"	"
21.....	0.24	"	"	"	"	"	"	"
22.....	0.20 ^a	"	"	"	"	"	"	"
23.....	0.16	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	0.05	"	"	"	"	"	"	"
29.....	Dry.	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

^a Gauge height interpolated.

MONTHLY DISCHARGE of Jones Creek at Stearns' Ranch, for 1914.

(Drainage area 5 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	18.20	2.10	6.930	1.380	1.54	412
May.....	2.30	0.88	17.790	3.540	4.08	1,088
June.....	2.50	0.34	11.200	2.240	2.50	666
July.....	0.51	0.00	0.126	0.025	0.03	8
August.....	"	"	"	"	"	^a
September.....	"	"	"	"	"	^a
October.....	"	"	"	"	"	^a
The period.....	"	"	"	"	8.15	2,174

^a Creek dry.

STEARNS DITCH NEAR DOLLARD.

Location.—On the SW. $\frac{1}{4}$ Sec. 20, Tp. 8, Rge. 20, W. 3rd Mer., 600 feet from headgate of ditch.

Records available.—Discharge measurements only in 1914.

Gauge.—Vertical staff, graduated to feet and inches; elevation, 97.46 feet.

Bench-mark.—Top of stake, marking initial point for soundings; assumed elevation, 100.00 feet.

Discharge measurements.—Made with weir.

Observer.—No observations in 1914.

DISCHARGE MEASUREMENTS of Stearns' Ditch near Dollard, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 4.....	F. R. Steinberger.....					0.115
April 30.....	do					0.094

SWIFTCURRENT CREEK AT SINCLAIR'S RANCH (UPPER STATION).

Location.—On the NE. $\frac{1}{4}$ Sec. 18, Tp. 10, Rge. 19, W. 3rd Mer., above the mouth of Bone Creek.

Records available.—June 15, 1910, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the gauge was maintained at 87.91 feet during 1910-11, and at 87.86 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—Made with meter, and by weir at low stages.

Winter flow.—This station is not maintained during the winter.

Diversions.—Messrs D. H. Pollock and J. W. E. Axton divert water for irrigation purposes above this station.

Observer.—Mrs. K. Sinclair.

Remarks.—Records at this station are affected by backwater from Bone Creek at certain stages of that stream.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek at Sinclair's Ranch (Upper Station) in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 28.....	M. H. French	7.0	3.40	0.43	2.80	1.43
April 16.....	do	15.0	22.30	1.53	2.18	34.00
May 1.....	F. R. Steinberger.....	11.6	5.10	1.55	0.71	7.90
May 20.....	do	10.9	4.21	1.13	0.55	4.70
June 23.....	do	9.7	2.34	0.82	0.42	1.93
July 10.....	do				0.24	0.14 ^a
Aug. 5.....	do					Nil.
Sept. 9.....	E. W. W. Hughes.....					
Oct. 2.....	do	10.0	2.20	1.06	0.44	2.30

^a Weir measurement.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch
(Upper Station), for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.50	62.0	0.72	8.20	0.38	1.39
2.....	3.75	67.0	0.72	8.20	0.38	1.39
3.....	5.04	96.0	0.71	8.00	0.37	1.26
4.....	5.25	100.0	0.71	8.00	0.42	1.99
5.....	5.32	102.0	0.70	7.80	0.66	6.90
6.....	5.40	104.0	0.69	7.60	0.69	7.60
7.....	4.90	93.0	0.75	8.90	0.76	9.10
8.....	4.20	78.0	0.79	9.70	0.70	7.80
9.....	4.07	75.0	0.80	10.00	0.61	5.90
10.....	2.90	50.0	0.84	10.80	0.55	4.60
11.....	2.72	45.0	0.75	8.90	0.45	2.50
12.....	2.63a	43.0	0.69	7.60	0.47	2.90
13.....	2.55	42.0	0.60	5.60	0.52	4.00
14.....	2.37	38.0	0.55	4.60	0.80	11.00
15.....	2.00	30.0	0.54	4.40	0.85	11.00
16.....	2.20	34.0	0.52	4.00	0.77	9.30
17.....	2.00	32.0	0.53	4.20	0.69	7.60
18.....	1.75	27.0	0.53	4.20	0.62	6.10
19.....	1.52	24.0	0.54	4.40	0.55	4.60
20.....	1.48	24.0	0.55	4.60	0.47	2.90
21.....	1.39	23.0	0.55	4.60	0.46	2.70
22.....	1.30	21.0	0.55	4.60	0.45	2.50
23.....	1.25	19.6	0.55	4.60	0.42	1.99
24.....	1.00	14.2	0.55	4.60	0.40	1.65
25.....	0.95	13.2	0.54	4.40	0.40	1.65
26.....	0.89	11.9	0.54	4.40	0.42	1.99
27.....	0.82	10.4	0.49	3.30	0.43	2.20
28.....	0.80	10.0	0.45	2.50	0.43	2.20
29.....	0.78	9.5	0.42	1.99	0.44	2.30
30.....	0.76	9.1	0.40	1.65	0.45	2.50
31.....			0.39	1.52		

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch,
(Upper Station), for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.47	2.90	Dry.	Nil.	0.60	5.60	0.33	0.78
2.....	0.46	2.70	"	"	0.60	5.60	0.39	1.52
3.....	0.44	2.30	"	"	0.60	5.60	0.42	1.99
4.....	0.42	1.99	"	"	Dry.	Nil.	0.57	5.00
5.....	0.40	1.65	"	"	"	"	1.00	14.20
6.....	0.40	1.65	"	"	"	"	1.80	31.00
7.....	0.37	1.26	"	"	"	"	1.99	36.00
8.....	0.33	0.78	"	"	"	"	1.99	36.00
9.....	0.27	0.27	"	"	"	"	1.87	33.00
10.....	0.24	0.14	"	"	"	"	1.50	25.00
11.....	0.22	0.12	"	"	"	"	1.43	24.00
12.....	0.22	0.12	"	"	0.70	7.80	1.00	14.20
13.....	0.21	0.11	"	"	0.30	0.45	0.89	11.90
14.....	0.21	0.11	"	"	1.25	19.60	0.68	7.40
15.....	0.23	0.13	"	"	1.30	21.00	0.55	4.60
16.....	0.22	0.12	"	"	1.32	21.00	0.49	3.30
17.....	0.21	0.11	"	"	1.30	21.00	0.46	2.70
18.....	0.21	0.11	"	"	1.17	17.90	0.45	2.50
19.....	0.21	0.11	"	"	1.00	14.20	0.42	1.99
20.....	0.22	0.12	"	"	0.87	11.40	0.40	1.65
21.....	0.21	0.11	"	"	0.40	1.65	0.40	1.65
22.....	0.20	0.10	"	"	0.38	1.39	0.41	1.82
23.....	0.19	0.09	0.10	"	0.37	1.26	0.43	2.20
24.....	0.17	0.07	0.12	0.02	0.36	1.13	0.43	2.20
25.....	0.17	0.07	Dry.	Nil.	0.33	0.78	0.41	1.82
26.....	0.16	0.06	"	"	0.30	0.45	0.43	2.20
27.....	0.16	0.06	"	"	0.30	0.45	0.42	1.99
28.....	0.16	0.06	"	"	0.29	0.39	0.43	2.20
29.....	0.14	0.04	"	"	0.30	0.45	0.43	2.20
30.....	0.10	Nil.	0.60	5.60	0.31	0.56	0.45	2.50
31.....	Dry.	"	0.70	7.80	"	"	0.44	2.30

MONTHLY DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Upper Station), for 1914.

(Drainage area 172 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	104.0	9.10	41.00	0.253	0.280	2,594
May.....	10.8	1.52	5.70	0.033	0.040	353
June.....	11.9	1.26	4.40	0.025	0.030	262
July.....	2.9	"	0.56	0.003	0.001	35
August.....	7.8	"	0.43	0.002	0.003	27
September.....	21.0	"	5.36	0.031	0.040	317
October.....	36.0	0.78	9.40	0.054	0.060	575
The period.....					0.457	4,163

MONTHLY DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Upper Station), for 1912.

(Drainage area 172 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
June (28-30).....	3.7	3.20	3.37	0.020c	0.001c	20
July.....	5.8	1.38	3.99	0.023	0.026	240
August.....	4.5	1.14	3.24	0.018	0.020	199
September.....	4.0	2.80	3.43	0.020	0.022	204
October.....	7.9	2.60	4.41	0.026	0.030	271
November (1-15).....	9.4	3.70	6.50	0.038	0.021	193
The period.....					0.120	1,127

NOTE.—This table is inserted in this report to correct a table on page 348 of the 1912 report. The drainage area and columns marked "c" have been corrected.

MONTHLY DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Upper Station), for 1913.

(Drainage area 172 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April (8-30).....	252.00	11.00	96.700	0.560c	0.480c	4,411
May.....	17.00	3.90	12.040	0.070	0.081	740
June.....	29.00	1.19	8.120	0.047	0.052	483
July.....	6.80	0.42	2.840	0.016	0.018	175
August.....	2.50	0.18	0.960	0.006	0.007	59
September.....	3.80	0.21	0.994	0.006	0.007	59
October.....	8.20	1.81	3.410	0.020	0.023	210
The period.....					0.668	6,137

NOTE.—This table is inserted in this report to correct a table on page 318 of the 1913 report. The drainage area and columns marked "c" have been corrected.

SESSIONAL PAPER No. 25c

BONE CREEK AT LEWIS' RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 34, Tp. 8, Rge. 22, W. 3rd Mer., at Klinton post office.*Records available.*—July 1, 1908, to October 31, 1914.*Gauge.*—Vertical staff; the elevation of the zero of the gauge has been maintained at 95.02 feet since establishment.*Bench-mark.*—Permanent iron bench-mark; assumed elevation, 100.00 feet.*Channel.*—Slightly shifting.*Discharge measurements.*—Made with meter, or with weir at low stages.*Winter flow.*—This station is not maintained during the winter.*Observer.*—C. L. Lewis.

DISCHARGE MEASUREMENTS of Bone Creek at Lewis' Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 28.....	F. R. Steinberger.....	5.7	2.1	0.93	0.20	1.99
May 18.....	do.....	5.8	2.1	0.88	0.21	1.82
June 16.....	do.....				0.17	1.61 _a
July 8.....	do.....				0.11	0.52 _a
July 31.....	do.....				0.08	0.44 _a
Aug. 27.....	E. W. W. Hughes.....				0.13	0.60 _a
Sept. 14.....	do.....	6.0	3.2	1.48	0.35	4.70

_a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bone Creek at Lewis' Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			0.50	7.70	0.22	2.10	0.16	1.15
2.....			0.47	7.10	0.22	2.10	0.12	0.66
3.....			0.60	9.70	0.22	2.10	0.12	0.66
4.....			0.32	4.10	0.24	2.50	0.33	4.30
5.....			1.00	17.70	0.47	7.10	0.33	4.30
6.....			1.04	18.50	0.27	3.10	0.23	2.40
7.....			0.73	12.30	0.30	3.70	0.15	1.00
8.....			0.32	4.10	0.30	3.70	0.12	0.66
9.....			0.32	4.10	0.30	3.70	0.12	0.66
10.....			0.28	3.10	0.30	3.70	0.11	0.55
11.....			0.50	7.70	0.29	3.50	0.11	0.55
12.....	1.95	37.00	1.19	22.00	0.27	3.10	0.11	0.55
13.....	1.13	20.00	0.56	8.90	0.25	2.70	0.32	4.10
14.....	1.04	18.50	0.61	9.90	0.25	2.70	0.16	1.15
15.....	0.92	16.10	0.43	6.30	0.25	2.70	0.12	0.66
16.....	0.92	16.10	0.34	4.50	0.25	2.70	0.11	0.55
17.....	0.30	3.70	0.25	2.70	0.25	2.70	0.11	0.55
18.....	0.30	3.70	0.22	2.10	0.25	2.70	0.11	0.55
19.....	0.31	3.90	0.21	1.94	0.24	2.50	0.10	0.44
20.....	0.65	10.70	0.21	1.94	0.24	2.50	0.10	0.44
21.....	0.65	10.70	0.22	2.10	0.25	2.70	0.24	2.50
22.....	0.42	6.10	0.22	2.10	0.24	2.50	0.11	0.55
23.....	0.25	2.70	0.22	2.10	0.24	2.50	0.10	0.44
24.....	0.20	1.75	0.22	2.10	0.22	2.10	0.10	0.44
25.....	0.18	1.45	0.22	2.10	0.22	2.10	0.11	0.55
26.....	0.15	1.00	0.22	2.10	0.22	2.10	0.12	0.66
27.....	0.15	1.00	0.22	2.10	0.21	1.94	0.12	0.66
28.....	0.15	1.00	0.22	2.10	0.21 _a	1.94	0.24	2.50
29.....	0.15	1.00	0.22	2.10	0.20	1.75	0.24	2.50
30.....	0.16	1.15	0.22	2.10	0.20	1.75	0.23	2.40
31.....	0.40	5.70			0.18	1.45		

DAILY GAUGE HEIGHT AND DISCHARGE of Bone Creek at Lewis' Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.	0.20	1.75	0.08	0.31	0.12	0.66	0.13	0.77
2.	0.18	1.45	0.08	0.31	0.12	0.66	0.13	0.77
3.	0.15	1.00	0.08	0.31	0.12	0.66	0.13	0.77
4.	0.13	0.77	0.08	0.31	0.12	0.66	0.20	1.75
5.	0.12	0.66	0.08	0.31	0.12	0.66	0.27	3.10
6.	0.12	0.66	0.08	0.31	0.12	0.66	0.27	3.10
7.	0.10	0.44	0.08	0.31	0.12	0.66	0.29	3.50
8.	0.10	0.44	0.08	0.31	0.12	0.66	0.31	3.90
9.	0.10	0.44	0.09	0.38	0.12	0.66	0.31	3.90
10.	0.10	0.44	0.09	0.38	0.12	0.66	0.31	3.90
11.	0.10	0.44	0.10	0.44	0.12	0.66	0.29	3.50
12.	0.10	0.44	0.10	0.44	0.20	1.75	0.20	1.75
13.	0.10	0.44	0.11	0.55	0.45	6.70	0.18	1.45
14.	0.10	0.44	0.11	0.55	0.31	3.90	0.18	1.45
15.	0.10	0.44	0.11	0.55	0.29	3.50	0.18	1.45
16.	0.11	0.55	0.11	0.55	0.15	1.00	0.18	1.45
17.	0.10	0.44	0.11	0.55	0.13	0.77	0.18	1.45
18.	0.10	0.44	0.11	0.55	0.13	0.77	0.15	1.00
19.	0.10	0.44	0.11	0.55	0.13	0.77	0.15	1.00
20.	0.10	0.44	0.11	0.55	0.13	0.77	0.13	0.77
21.	0.10	0.44	0.11	0.55	0.13	0.77	0.13	0.77
22.	0.10	0.44	0.11	0.55	0.13	0.77	0.12	0.66
23.	0.10	0.44	0.12	0.66	0.13	0.77	0.12	0.66
24.	0.10	0.44	0.15	1.00	0.13	0.77	0.12	0.66
25.	0.10	0.44	0.15	1.00	0.13	0.77	0.12	0.66
26.	0.09	0.38	0.15	1.00	0.13	0.77	0.12	0.66
27.	0.08	0.31	0.13	0.77	0.13	0.77	0.12	0.66
28.	0.08	0.31	0.13	0.77	0.13	0.77	0.12	0.66
29.	0.08	0.31	0.13	0.77	0.13	0.77	0.12	0.66
30.	0.09	0.38	0.12	0.66	0.13	0.77	0.12	0.66
31.	0.09	0.38	0.12	0.66	.....	.....	0.12	0.66

MONTHLY DISCHARGE of Bone Creek at Lewis' Ranch, for 1914.

(Drainage area 17 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (12-31).....	37.00	1.00	8.20	0.480	0.36	323
April.....	18.50	1.94	5.90	0.350	0.39	352
May.....	7.10	1.45	2.70	0.160	0.18	167
June.....	4.30	0.44	1.30	0.077	0.08	77
July.....	1.75	0.31	0.54	0.032	0.04	33
August.....	1.00	0.31	0.54	0.032	0.04	34
September.....	6.70	0.66	1.16	0.068	0.08	69
October.....	3.90	0.66	1.55	0.090	0.10	95
The period.....					1.27	1,150

SESSIONAL PAPER No. 25c

SWIFTCURRENT CREEK AT SINCLAIR'S RANCH (LOWER STATION)

Location.—On the NW. $\frac{1}{4}$ Sec. 17, Tp. 10, Rge. 19, W. 3rd Mer., and below the mouth of Bone Creek.

Records available.—May 27, 1910, to October 31, 1914.

Gauge.—Chain gauge, attached to floor of highway bridge; the zero of the gauge was maintained at 85.73 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark, located on the right bank about 600 feet upstream from the bridge; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—Made with meter from bridge or by wading, and with a weir at very low stages.

Winter flow.—This station is not maintained during the frozen season.

Observer.—Mrs. K. Sinclair.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek at Sinclair's Ranch (Lower Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 28.....	M. H. French.....	18.0	18.4	0.75	4.22	13.90
April 16.....	do.....	20.0	54.7	1.59	3.80	87.00
May 1.....	F. R. Steinberger.....	30.7	23.0	1.19	2.25	27.00
May 20.....	do.....	29.3	19.3	0.95	2.01	18.30
June 23.....	do.....	29.0	14.2	0.68	1.73	9.80
July 10.....	do.....	15.5	4.1	0.83	1.40	3.40
Aug. 5.....	do.....				0.99	0.01a
Sept. 9.....	E. W. W. Hughes.....	13.0	4.3	0.99	1.40	4.20
Oct. 2.....	do.....	26.0	14.2	0.97	1.89	13.80

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek at Sinclair's Ranch (Lower Station), for 1914.

DAY.	April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	4.73	123	2.24	27.0	1.73	9.8
2.....	4.80	125	2.21	26.0	1.70	9.0
3.....	5.97	168	2.19	25.0	1.71	9.3
4.....	6.32	184	2.22	26.0	1.76	10.6
5.....	6.70	174	2.24	27.0	2.22	26.0
6.....	7.00	210	2.29	29.0	2.28	28.0
7.....	6.75	176	2.39	33.0	2.43	34.0
8.....	6.18	178	2.43	34.0	2.40	33.0
9.....	5.90	168	2.44	35.0	2.31	30.0
10.....	4.95	132	2.51	37.0	2.13	23.0
11.....	5.00	133	2.40	33.0	1.90	14.7
12.....	4.64	119	2.29	29.0	1.92	15.4
13.....	4.28	106	2.21	26.0	2.03	19.2
14.....	4.05	96	2.16	24.0	2.71	45.0
15.....	3.94	92	2.04	19.5	2.42	34.0
16.....	3.80	87	1.98	17.4	2.34	31.0
17.....	3.75	85	1.98	17.4	2.20	25.0
18.....	3.72	84	2.00	18.1	2.07	21.0
19.....	3.68	82	2.03	19.2	2.00	18.1
20.....	3.67	82	2.01	18.5	1.90	14.7
21.....	3.50	75	2.01	18.5	1.82	12.2
22.....	3.37	70	2.00	18.1	1.77	10.8
23.....	2.95	54	1.97	17.0	1.75	10.3
24.....	2.64	42	1.97	17.0	1.71	9.3
25.....	2.63	42	1.93	15.7	1.72	9.5
26.....	2.69	44	1.92	15.4	1.69	8.8
27.....	2.64	42	1.90	14.7	1.71	9.3
28.....	2.51	37	1.88	14.1	1.81	11.9
29.....	2.35	31	1.86	13.4	1.82	12.2
30.....	2.33	30	1.86	13.4	1.81	11.9
31.....			1.84	12.8		

DAILY GAUGE HEIGHT AND DISCHARGE of Swifteurrent Creek at Sinclair's Ranch
(Lower Station), for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.81	11.90	1.04	0.34	1.42	3.70	1.64	7.6
2.....	1.76	10.60	1.03	0.28	1.43	3.80	1.68	8.5
3.....	1.74	10.00	1.03	0.28	1.45	4.10	1.66	8.8
4.....	1.70	9.00	1.02	0.22	1.43	3.80	2.09	21.0
5.....	1.69	8.80	1.99	0.09	1.40	3.40	2.92	53.0
6.....	1.68	8.50	1.98	0.08	1.38	3.20	3.43	73.0
7.....	1.56	6.00	0.98	0.08	1.37	2.00	3.92	92.0
8.....	1.45	4.10	0.97	0.07	1.34	2.70	3.98	94.0
9.....	1.35	2.80	0.95	0.05	1.40	3.40	3.90	91.0
10.....	1.21	1.48	0.95	0.05	1.45	4.10	3.65	81.0
11.....	1.17	1.16	0.96	0.06	1.47	4.40	3.52	76.0
12.....	1.15	1.00	0.95	0.05	1.50	1.90	2.95	54.0
13.....	1.15	1.00	0.93	0.03	1.64	7.60	2.55	38.0
14.....	1.14	0.94	0.93	0.03	2.55	38.00	2.42	34.0
15.....	1.17	1.16	0.94	0.04	2.80	48.00	2.25	27.0
16.....	1.19	1.32	0.95	0.05	3.20	64.00	2.05	19.9
17.....	1.19	1.32	0.97	0.07	3.05	58.00	1.98	17.4
18.....	1.18	1.24	0.99	0.09	2.35	31.00	1.90	14.7
19.....	1.17	1.16	0.99	0.09	2.21	26.00	1.91	15.0
20.....	1.15	1.00	0.90	Nil	2.06	20.00	1.91	15.0
21.....	1.10	0.70	0.90	Nil	1.90	14.70	1.90	14.7
22.....	1.05	0.40	0.99	0.09	1.82	12.20	1.99	17.8
23.....	1.08	0.58	1.00	0.10	1.77	10.80	1.96	16.7
24.....	1.10	0.70	1.45	4.10	1.70	9.00	1.92	13.4
25.....	1.10	0.70	1.50	4.90	1.67	8.30	1.93	15.7
26.....	1.11	0.76	1.46	4.30	1.60	6.70	1.98	17.4
27.....	1.10	0.70	1.44	4.00	1.59	6.50	1.99	17.8
28.....	1.08	0.58	1.41	3.50	1.52	5.40	1.99	17.8
29.....	1.06	0.46	1.40	3.40	1.55	5.80	2.02	18.8
30.....	1.05	0.40	1.41	3.50	1.60	6.70	2.00	18.1
31.....	1.05	0.40	1.42	3.70	.....	.....	2.00	18.1

MONTHLY DISCHARGE of Swifteurrent Creek at Sinclair's Ranch (Lower Station), for 1914.

(Drainage area 366 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	210.0	30.00	102.00	0.280	0.310	6,069
May.....	37.0	12.80	22.00	0.060	0.070	1,371
June.....	45.0	8.80	1.86	0.050	0.060	1,107
July.....	11.9	0.40	2.90	0.008	0.009	180
August.....	4.9	Nil	1.08	0.003	0.004	66
September.....	64.0	2.70	14.10	0.038	0.040	839
October.....	94.0	7.60	33.00	0.091	0.010	2,041
The period.....					0.503	11,673

SESSIONAL PAPER No. 25c

SWIFTCURRENT CREEK NEAR SWIFT CURRENT (UPPER STATION).

Location.—On the SW. $\frac{1}{4}$ Sec. 12, Tp. 15, Rge. 14, W. 3rd Mer., above the city of Swift Current's water-supply dam.

Records available.—January 16, 1914, to December 31, 1914.

Gauge.—Vertical staff at old section; zero elevation 91.72 feet since establishment. Vertical staff at weir; zero elevation 89.90 feet since establishment. Crest of weir at elevation 98.58 feet.

Bench-mark.—On top of a pile at upstream face of left abutment, marked D.I.; assumed elevation, 100.00 feet. Bench-mark for weir measurements on granite rock on left bank; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—At high stages from bridge; at low stages by wading or by weir.

Winter flow.—Affected by ice.

Observer.—Mrs. Mackintosh.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek near Swift Current (Upper Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 16.....	F. R. Steinberger.....	4.7	3.25	0.46	3.00	1.48
Feb. 6.....	do.....				2.36	.....^a
Feb. 25.....	do.....	6.5	2.88	0.51	2.90	1.47
Mar. 19.....	do.....	64.0	74.80	1.59	4.78	119.00
May 4.....	W. H. Storey.....	66.0	111.00	0.60	2.63	66.00
June 12.....	do.....	68.0	111.00	0.39	2.55	45.00
July 7.....	do.....	35.5	21.19	0.83	2.35	17.60
Aug. 4.....	do.....	17.0	4.60	0.11	1.86	0.52
Sept. 3.....	do.....	6.0	2.60	0.82	1.98	2.10
Oct. 5.....	F. R. Steinberger.....	40.5	38.20	0.69	2.48	26.00
Nov. 12.....	do.....	7.9	8.97	2.97	2.41	24.00
Nov. 16.....	do.....	9.7	8.18	1.47	2.31	12.10
Dec. 2.....	J. E. Caughey.....	36.0	33.60	0.70	2.54	24.00
Dec. 21.....	do.....	30.0	15.50	0.43	9.34	6.60

^a Frozen solid.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Upper Station), for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			2.65	0.50	3.21	4.0	4.70	200.0	2.56a	48.0	2.31	15.3
2.			2.60	0.40	3.31	5.3	4.85	215.0	2.58a	52.0	2.27	11.5
3.			2.55	0.30	3.36	6.6	5.00	268.0	2.60a	57.0	2.30	7.9
4.			2.50	0.20	3.56	8.0	5.00	270.0	2.63	67.0	2.30	7.9
5.			2.45	0.07	3.91	9.2	6.00	240.0	2.63	67.0	2.35	13.0
6.			2.36	0.01	4.01	10.5	6.50	370.0	2.62	64.0	2.43	25.0
7.			2.31	0.01	4.31	11.7	6.82	360.0	2.64	71.0	2.50	34.0
8.			2.21	0.08	4.61	13.0	6.70	360.0	2.63	67.0	2.45	27.0
9.			2.16	0.19	4.71	14.4	6.70	390.0	2.61	60.0	2.45	27.0
10.			2.11	0.39	4.61	15.7	6.75	325.0	2.59	55.0	2.45	27.0
11.			2.01	0.65	4.66	35.0	6.70	320.0	2.61	60.0	2.44	26.0
12.			3.76	1.10	5.01	51.0	6.50	285.0	2.63	67.0	2.55	45.0
13.			4.01	1.50	5.31	77.0	6.00	310.0	2.63	67.0	2.46	28.0
14.			4.01	1.84	5.21	92.0	5.81	310.0	2.59	55.0	2.51	36.0
15.			3.31	2.00	5.26	104.0b	5.25	290.0	2.54	43.0	2.54	43.0
16.	3.01	1.48b	3.21	2.00	4.75	119.0	4.95	290.0	2.53	41.0	2.50	34.0
17.	3.01	1.40	3.11	2.00	4.10	220.0c	4.38	240.0	2.53	41.0	2.50	34.0
18.	3.01	1.30	3.01	1.93	4.30	330.0	4.15	255.0	2.52	39.0	2.49	33.0
19.	3.00	1.20	3.01	1.74	4.15	328.0	3.95	255.0	2.52	39.0	2.48	31.0
20.	2.90	1.07	2.96	1.52	4.64	340.0	3.52	220.0	2.49	33.0	2.47	30.0
21.	2.90	0.97	2.91	1.45	4.99	270.0	3.10	165.0	2.49	33.0	2.47	30.0
22.	2.71	0.90	2.91	1.40	5.30	260.0	3.00	150.0c	2.49	33.0	2.48	31.0
23.	2.71	0.82	3.01	1.40	4.90	185.5	2.70	92.0	2.47	30.0	2.48	31.0
24.	2.71	0.77	3.06	1.45	4.70	180.0	2.68	85.0	2.44	26.0	2.48	31.0
25.	2.62	0.73	3.01	1.50	4.70	170.0	2.55	42.0	2.42	23.0	2.48	31.0
26.	2.62	0.71	3.01	1.60	4.90	160.0	2.45	27.0	2.39	20.0	2.48	31.0
27.	2.73	0.70	3.11	1.80	4.50	150.0	2.36	17.6	2.38	19.2	2.48	31.0
28.	2.72	0.68	3.16	2.50	4.40	150.0	2.40a	21.0	2.34	16.1	2.47	30.0
29.	2.76	0.66			4.40	140.0	2.44a	26.0	2.34	16.1	2.47	30.0
30.	2.71	0.62			4.35	130.0	2.48a	31.0	2.33	15.3	2.46	28.0
31.	2.66	0.57			4.50	140.0			2.33	15.3		

a Gauge height interpolated.

b Ice conditions Jan. 16 to March 16.

c Discharge estimated March 17 to April 22.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Upper Station), for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.	2.45	27.0	1.94	1.60	1.97	2.05	2.32	14.5	2.37	18.4	2.69	24.0
2.	2.44	26.0	1.91	1.15	1.99	2.40	2.31	13.8	2.36	17.6	2.63	24.0
3.	2.42	23.0	1.89	0.95	2.02	3.00	2.32	14.5	2.36	17.6	2.60	23.0
4.	2.40	20.7	1.86	0.80	2.01	2.70	2.37	18.4	2.36	17.6	2.58	22.0
5.	2.37	18.4	1.84	0.70	1.99	2.30	2.46	28.0	2.37	18.4	2.55	20.0
6.	2.36	17.6	1.83	0.65	1.98	2.20	2.48	31.0	2.38	19.2	2.57	18.8
7.	2.33	15.3	1.81	0.55	1.97	2.00	2.49	33.0	2.40	21.0	2.57	17.3
8.	2.31	13.8	1.78	0.46	1.96	1.90	2.52	39.0	2.41	22.0	2.58	16.4
9.	2.28	12.0	1.76	0.42	1.96	1.90	2.57	50.0	2.36	17.6	2.58	15.6
10.	2.27	11.5	1.73	0.36	1.97	2.00	2.58	52.0	2.38	19.2	2.59	14.2
11.	2.24	9.9	1.70	0.30	1.97	2.00	2.61	61.0	2.41	22.0	2.60	12.2
12.	2.22	8.9	1.67	0.27	1.98	2.20	2.65	74.0	2.38	19.2	2.60	9.0
13.	2.20	7.9	1.65	0.25	2.03	3.20	2.71	96.0	2.37	18.4	2.60	7.0
14.	2.18	7.3	1.63	0.23	2.53	41.00	2.75	111.0	2.36	17.6	2.60	6.8
15.	2.15	6.4	1.61	0.21	2.60	57.00	2.72	100.0	2.34	16.1	2.61	6.7
16.	2.14	6.0	1.59	0.19	2.62	64.00	2.71	96.0	2.31	12.1	2.61	6.9
17.	2.14	6.0	1.57	0.17	2.66	78.00	2.66	78.0	2.30	12.7	2.62	8.0
18.	2.13	5.7	1.56	0.16	2.69	88.00	2.61	60.0	2.28	13.3	2.62	8.5
19.	2.13	5.7	1.56	0.16	2.71	96.00	2.57	50.0	2.28	15.5	2.63	8.0
20.	2.12	5.4	1.54	0.14	2.68	85.00	2.52	39.0	2.31	19.5	2.63	7.0
21.	2.12	5.4	1.52	0.12	2.64	71.00	2.50	34.0	2.35	21.0	9.34d	6.9
22.	2.11	5.1	1.51	0.11	2.62	64.00	2.47	30.0	2.41	22.0	9.40	7.8
23.	2.08	4.3	1.50	0.10	2.58	52.00	2.46	29.0	2.47	23.0	9.40	7.8
24.	2.07	4.1	1.50	0.10	2.53	41.00	2.45	27.0	2.52	25.0	9.39	7.7
25.	2.05	3.6	1.50	0.10	2.48	31.00	2.45	27.0	2.54	27.0	9.39	7.7
26.	2.03	3.2	1.57	0.17	2.44	26.00	2.45	27.0	2.65	28.0	9.35	7.1
27.	2.02	3.0	1.74	0.38	2.41	22.00	2.44	26.0	2.65	28.0	9.35	7.1
28.	2.01	2.7	1.83	0.65	2.38	19.20	2.44	26.0	2.65	27.0	9.30	6.3
29.	2.00	2.5	1.92	1.30	2.35	16.80	2.43	25.0	2.68	26.0	9.30	6.3
30.	1.99	2.3	1.96	1.90	2.34	16.10	2.42	23.0	2.67	25.0	9.35	7.1
31.	1.98	2.2	1.97	2.00	.....	.....	2.40	21.0	.....	.....	9.40d	7.7

d to d Weir measurements—new rod.

MONTHLY DISCHARGE of Swiftcurrent Creek near Swift Current (Upper Station), for 1914.
(Drainage area 995 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile	Depth in inches on Drainage Area.	Total in Acre-feet.
January	1.48	0.57	0.91	0.0009	0.0005	29
February	2.50	0.01	1.14	0.0011	0.0011	63
March	340.00	4.00	120.00	0.1210	0.1400	7,378
April	390.00	17.60	214.00	0.2150	0.2400	12,734
May	71.00	15.30	43.00	0.0430	0.0500	2,644
June	45.00	7.90	28.00	0.0280	0.0300	1,666
July	27.00	2.20	9.40	0.0094	0.0010	578
August	2.00	0.10	0.54	0.0005	0.0006	33
September	96.00	1.90	30.00	0.0302	0.0340	1,785
October	111.00	13.80	44.00	0.0442	0.0500	2,705
November	28.00	12.10	20.00	0.0201	0.0200	1,190
December	24.00	6.30	11.40	0.0114	0.0100	701
The year	.....	.....	.....	.....	0.5800	31,506

SWIFTCURRENT CREEK NEAR SWIFT CURRENT (LOWER STATION).

Location.—On the NW. $\frac{1}{4}$ Sec. 18, Tp. 15, Rge. 13, W. 3rd Mer., below the water supply dam of the city of Swift Current.

Records available.—May 5, 1913, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero has been maintained at 87.195 feet since establishment.

Bench-mark.—On rock; assumed elevation up to June 11, 1914, 100.00 feet. From June 12, 1914, to December 31, 1914, rock near creek used, with an elevation of 97.24 feet.

Channel.—Permanent.

Discharge measurements.—By wading or from bridge.

Winter flow.—Affected by ice.

Artificial control.—The flow of the creek at this point is affected to some extent by the city water supply dam.

Observer.—Stanley Tite.

DISCHARGE MEASUREMENTS of Swiftcurrent Creek near Swift Current (Lower Station), in 1914.

Date.		Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
			<i>Feet.</i>	<i>Sq. feet.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan.	17	F. R. Steinberger				0.83	1.92a
Feb.	6	do	5.8	5.2	0.48	1.65	2.50
Feb.	25	do	7.2	2.1	0.66	2.10	1.38
March	16	do	45.0	42.0	2.77	1.92	116.00
May	4	W. H. Storey	55.0	100.0	0.65	1.27	65.00
June	12	do	55.0	96.0	0.46	1.20	44.00
July	7	do	55.0	74.0	0.23	0.84	17.10
Aug.	4	do	11.5	2.7	1.11	0.62	3.00
Sept.	3	do	100.0	2.2	0.62	0.46	1.32
Oct.	5	F. R. Steinberger	29.0	20.6	1.25	1.05	26.00
Nov.	16	do	20.0	10.6	1.07	0.89	11.40
Dec.	2	J. E. Caughey	44.0	50.0	0.71	1.10	35.00
Dec.	21	do	22.0	13.0	0.52	0.59	6.80

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Lower Station), for 1914.

DAY.	January.		February.		March.		April.		May.		June	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1	1.21	1.05c	0.40a	2.40	3.05	4.0	1.23	55	1.29	71.0	0.93	13.9
2	1.32	1.10	0.50a	2.27	3.04	6.0	1.78	218	1.25	60.0	0.90	15.2
3	1.21	1.12	0.60a	2.24	3.06	7.5	1.94	266	1.25	60.0	0.95	18.4
4	1.20	1.15	1.00a	2.26	3.20	9.0	1.94	266	1.24	58.0	0.95	18.4
5	0.88	1.18	1.42a	2.40	3.19	11.0	2.18	238	1.24	58.0	1.00	22.0
6	0.83	1.20	1.83	2.54	3.16	12.5	2.28	368	1.23	55.0	1.08	29.0
7	0.79	1.25	2.05	2.58	4.05	14.0	2.26	362	1.25	60.0	1.15	40.0
8	0.77	1.30	2.19	2.60	3.70	16.0	2.24	356	1.24	58.0	1.10	32.0
9	0.76	1.35	2.36	2.58	3.80	18.0b	2.34	386	1.22	53.0	1.10	32.0
10	0.79	1.40	2.31	2.50	3.83	20.0	2.14	326	1.20	48.0	1.10	32.0
11	0.81	1.44	2.26	2.42	3.85	30.0	2.12	320	1.22	53.0	1.09	30.0
12	0.85	1.48	2.16	2.30	3.18a	40.0	2.01	287	1.24	58.0	1.20	48.0
13	0.82	1.51	1.96	2.23	2.16a	50.0	2.09	311	1.24	58.0	1.15	40.0
14	0.72	1.60	1.92	2.23	2.14a	100.0	2.08	308	1.20	48.0	1.10	32.0
15	0.72	1.70	1.66	2.25	2.16	144.0cb	2.02	290	1.15	40.0	1.09	30.0
16	0.67	1.82	1.63	2.26	3.02	216.0	2.02	290	1.14	38.0	1.65	179.0
17	0.90	1.90	1.66	2.21	2.11	317.0	1.85	239	1.14	38.0	1.00	22.0
18	0.73	1.94	1.53	2.15	2.11	317.0	1.90	254	1.13	37.0	1.45	119.0
19	0.58a	1.96	1.31	2.00	2.20	344.0	1.90	254	1.13	37.0	0.60	3.3
20	0.58	1.98	0.66	1.70	1.94	266.0	1.79	221	1.10	32.0	0.80	9.8
21	0.51	2.01	0.46a	1.45	1.91	257.0	1.60	164	1.10	32.0	1.00	22.0
22	0.48	2.04	1.90a	1.20	1.61	167.0	1.56	152	1.10	32.0	1.20	48.0
23	0.44a	2.10	2.20a	1.20	1.56	152.0	1.55	149	1.08	30.0	0.65	4.4
24	0.32a	2.18	2.70a	1.30	1.48a	128.0	1.53	143	1.05	27.0	0.60	3.3
25	0.33a	2.28	3.10a	1.40	1.44	116.0	1.49	131	1.03	25.0	0.55	2.4
26	0.37a	2.42	3.05	1.43	1.29	71.0	1.45	119	1.00	22.0	0.65	4.4
27	0.40a	2.50	3.06	1.55	1.20	48.0	1.40	104	0.99	21.0	0.60	3.3
28	0.35a	2.58	3.07	2.10	1.27	66.0	1.38	98	0.95	18.4	0.55	2.4
29	0.30a	2.63			1.27	66.0	1.36	92	0.95	18.4	0.90	15.2
30	0.40a	2.61			1.27	66.0	1.30	74	0.94	17.2	0.84	11.3
31	0.30a	2.51			1.28	68.0			0.94	17.2		

a Interpolated.

b to b Estimated.

c Ice conditions Jan. 1 to March 15.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Swiftcurrent Creek near Swift Current (Lower Station), for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.85	12.3	0.65	4.40	0.31	0.13	0.87	13.4	1.04	26.0	1.05	36.0
2.....	0.86	12.9	0.60	3.30	0.31	0.13	0.87	13.4	1.03	25.0	1.05	35.0
3.....	0.86	12.9	0.63	3.90	0.46	1.27	0.85	12.3	1.02	24.0	1.00	22.0
4.....	0.85	12.3	0.62	3.70	0.43	0.87	0.95 ^a	18.4	1.00	22.0	0.90	15.6
5.....	0.90	15.2	0.50	2.40	0.45	1.05	1.05	27.0	1.00	22.0	0.88	14.4
6.....	0.85	12.3	0.38	0.46	0.45	1.05	1.07	29.0	1.00	22.0	0.86	13.3
7.....	0.80	9.8	0.36	0.32	0.45	1.05	1.06	28.0	1.00	22.0	0.80	12.1
8.....	0.78	9.0	0.34	0.22	0.45	1.05	1.05	27.0	1.00	22.0	0.80	12.1
9.....	0.76	8.1	0.31	0.13	0.49	1.49	1.15	40.0	0.90	15.2	0.82	12.7
10.....	0.73	7.0	0.31	0.13	0.52	1.92	1.15	40.0	0.96	20.0	0.80	12.1
11.....	0.70	6.0	0.31	0.13	0.55	2.40	1.17	43.0	1.00	22.0	0.75	10.6
12.....	0.75	7.7	0.31	0.13	0.60	3.30	1.33	83.0	1.00	22.0	0.70	9.1
13.....	0.73	7.0	0.31	0.13	0.80 ^a	9.80	1.35	89.0	1.00	22.0	0.70	9.0
14.....	0.66	4.7	0.31	0.13	1.00	22.00	1.30	74.0	0.90	15.2	0.70	9.0
15.....	0.60	3.3	0.31	0.13	1.15	40.00	1.25	60.0	0.80	12.0 ^b	0.65	8.5
16.....	0.60	3.3	0.32	0.16	1.10	32.00	1.25	60.0	0.80	12.0	0.66	7.7
17.....	0.55	2.4	0.32	0.16	1.35	89.00	1.20	48.0	0.85	14.6	0.60	6.8
18.....	0.60	3.3	0.32	0.16	1.30	74.00	1.15	40.0	0.85	15.7	0.58	6.5
19.....	0.65	4.4	0.31	0.13	1.26	63.00	1.10	32.0	0.90	16.5	0.60	6.8
20.....	0.60	3.3	0.31	0.13	1.15	40.00	1.05	27.0	0.87	15.3	0.60	6.8
21.....	0.65	4.4	0.30	0.10	1.15	40.00	1.03	25.0	0.87	15.3	0.59	6.8
22.....	0.65	4.4	0.32	0.16	1.10	32.00	1.05	27.0	0.90	15.7	0.59	6.7
23.....	0.65	4.4	0.34	0.22	1.05	27.00	1.05	27.0	0.90	16.2	0.60	6.7
24.....	0.65	4.4	0.38	0.46	1.05	27.00	1.05	27.0	0.90	16.9	0.60 ^a	6.8
25.....	0.63	3.9	0.36	0.32	0.95	18.40	1.05	27.0	1.00	23.0	0.59	7.0
26.....	0.60	3.3	0.33	0.19	0.95	18.40	1.05	27.0	1.05	29.0	0.60	7.0
27.....	0.65	4.4	0.32	0.16	0.95	18.40	1.05	27.0	1.05	32.0	0.57	6.4
28.....	0.61	3.5	0.31	0.13	0.90	15.20	1.05	27.0	1.10	35.0	0.54	5.8
29.....	0.60	3.3	0.31	0.13	0.90	15.20	1.04	26.0	1.10	36.0	0.50	5.3
30.....	0.60	3.3	0.31	0.13	0.88	14.00	1.04	26.0	1.10	36.0	0.50	5.3
31.....	0.65	4.4	0.31	0.13	.....	.....	1.04	26.0	.....	.....	0.50	5.3 ^b

^a Interpolated.^b Ice conditions Nov. 15 to Dec. 31.

MONTHLY DISCHARGE of Swiftcurrent Creek near Swift Current (Lower Station), for 1914.

(Drainage area 1,000 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	2.6	1.05	1.77	0.0018	0.0020	109
February.....	2.6	1.20	2.07	0.0020	0.0020	115
March.....	344.0	4.00	102.00	0.1020	0.1200	6,272
April.....	386.0	55.00	228.00	0.2280	0.2500	13,567
May.....	71.0	17.20	41.00	0.0410	0.0500	2,521
June.....	179.0	2.40	29.00	0.0290	0.0300	1,726
July.....	15.2	2.40	6.50	0.0065	0.0100	400
August.....	4.4	0.10	0.73	0.0007	0.0008	45
September.....	89.0	0.13	20.00	0.0200	0.0200	1,190
October.....	89.0	12.30	35.00	0.0350	0.0400	2,152
November.....	36.0	12.00	21.00	0.0210	0.0200	1,250
December.....	36.0	5.30	10.80	0.0110	0.0100	664
The year.....	.....	.....	.....	.....	0.5550	30,011

ANTELOPE LAKE DRAINAGE BASIN.

General description.

Antelope Lake is a small body of saline water, six miles long and from one to one-and-one-half miles wide, situated at an elevation of 2,300 feet above sea level. It lies in a deep depression north of the main line of the Canadian Pacific Railway, in Township 15, Range 18, West of the 3rd Meridian, and drains an area of about 350 square miles.

The lake receives its supply from Bridge Creek, which rises in the Cypress Hills. The altitude of the source of this creek is 2,800 feet, and it has an average fall of 15 feet per mile.

The valley traversed by Bridge Creek is narrow and quite shallow, rarely exceeding 100 feet in depth. The land lying along the creek bottom is very flat, and liable to become inundated during periods of flood. The bench land is rolling prairie, cut up by innumerable coulees, which drain the surrounding country into the main valley.

The mean annual rainfall amounts to about 14 inches, most of which occurs during May, June and July. The creek has only a small flow, and is dry along most of its course for several months during the year.

BRIDGE CREEK AT RAYMOND'S RANCH.

Location.—On the SE. $\frac{1}{4}$ of Sec. 33, Tp. 10, Rge. 22, W. 3rd Mer.

Records available.—April 8, 1911, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 89.42 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter at flood stages, and with weir at ordinary stages.

Winter flow.—This station is not maintained during the winter.

Observer.—Mrs. C. Raymond.

DISCHARGE MEASUREMENTS of Bridge Creek at Raymond's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 20	H. O. Brown				0.90	0.50
Mar. 30	do	3.3	1.96	0.64	1.02	1.26
April 1	do	8.1	4.64	0.98	1.22	4.50
April 11	do	3.2	1.72	0.67	0.84	1.16
April 24	F. R. Steinberger				0.69	0.47 _a
May 16	do				0.55	0.19 _a
June 15	do				0.53	0.17 _a
July 6	do				0.41	0.03 _a
July 29	do					Nil.
Sept. 8	E. W. W. Hughes				0.48	0.09 _a
Sept. 28	do				0.50	0.11 _a
Nov. 4	do				0.55	0.22 _a

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bridge Creek at Raymond's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.80	18.60a	1.26	3.20	0.56	0.20	0.40	0.02
2.....	3.05	21.00	1.18	2.40a	0.54	0.18	0.38	Nil.
3.....	3.15	22.00	1.10	3.30	0.58	0.23	0.42	0.04
4.....	3.20	23.00	1.12	3.50	0.60	0.26	0.45	0.07
5.....	3.15	22.00	1.04	2.80	0.66	0.39	0.53	0.16
6.....	2.90	19.60	1.08	3.20	0.68	0.44	0.56	0.20
7.....	3.18	22.00	1.05	2.90	0.69	0.46	0.50	0.12
8.....	2.90	19.60	1.00	2.40	0.68	0.44	0.58	0.23
9.....	3.05	21.00	0.98	2.20	0.60	0.26	0.56	0.20
10.....	3.00	21.00	0.80	0.86	0.63	0.33	0.56	0.20
11.....	2.85	19.10	0.85	1.17	0.59	0.25	0.58	0.23
12.....	2.90	19.60	1.05	2.90	0.58	0.23	0.53	0.16
13.....	2.55	16.10	1.00	2.40	0.56	0.20	0.58	0.23
14.....	2.60	16.60	0.95	1.93	0.54	0.18	0.53	0.16
15.....	2.05	11.10	0.98	2.20	0.50	0.12	0.53	0.16
16.....	1.50	5.60	0.90	1.48	0.55	0.19	0.50	0.12
17.....	1.80	8.60	0.88	1.36	0.53	0.16	0.48	0.10
18.....	1.35	4.10	0.83	1.05	0.55	0.19	0.50	0.12
19.....	1.05	1.35	0.80	0.86	0.53	0.16	0.56	0.20
20.....	0.88	0.53	0.78	0.78	0.50	0.12	0.55	0.19
21.....	0.85	0.45	0.70	0.48	0.52	0.15	0.53	0.16
22.....	0.85	0.45	0.63	0.33	0.48	0.10	0.50	0.12
23.....	0.85	0.45	0.60	0.26	0.50	0.12	0.50	0.12
24.....	0.85	0.45	0.69	0.46	0.46	0.08	0.53	0.16
25.....	0.80	0.32	0.63	0.33	0.43	0.05	0.48	0.10
26.....	0.80	0.32	0.60	0.26	0.50	0.12	0.47	0.09
27.....	0.80	0.32	0.63	0.33	0.46	0.08	0.50	0.12
28.....	0.80	0.32	0.60	0.26	0.43	0.05	0.53	0.16
29.....	0.80	0.32	0.58	0.23	0.40	0.02	0.51	0.13
30.....	1.32	3.80	0.56	0.20	0.38	Nil.	0.50	0.12
31.....	1.80	8.60	.....	.....	0.40	0.02	.....	.....

a to a Ice conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Bridge Creek at Raymond's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.48	0.10	Dry.	Nil.	0.53	0.16	0.48	0.10
2.....	0.46	0.08	"	"	0.53	0.16	0.51	0.13
3.....	0.45	0.07	"	"	0.52	0.15	0.78	0.78
4.....	0.43	0.05	"	"	0.54	0.18	0.88	1.36
5.....	0.39	0.01	"	"	0.55	0.19	0.75	0.67
6.....	0.41	0.03	"	"	0.52	0.15	0.90	1.48
7.....	0.44	0.06	"	"	0.50	0.12	1.40	6.30
8.....	0.42	0.04	"	"	0.50	0.12	1.50	7.30
9.....	0.40	0.02	0.37	"	0.51	0.13	1.20	4.30
10.....	0.40	0.02	0.37	"	0.48	0.10	1.03	2.70
11.....	0.38	Nil.	0.40	0.02	0.49	0.11	0.90	1.48
12.....	0.37	"	0.38	Nil.	0.55	0.19	0.87	1.29
13.....	0.36	"	0.38	"	0.88	1.36	0.80	0.86
14.....	Dry.	"	0.39	0.01	1.10	3.30	0.71	0.52
15.....	0.37	"	0.37	Nil.	0.73	0.59	0.65	0.37
16.....	0.38	"	0.36	"	0.70	0.48	0.63	0.33
17.....	0.40	0.02	0.39	0.01	0.68	0.44	0.60	0.26
18.....	0.36	Nil.	0.41	0.03	0.70	0.48	0.57	0.22
19.....	0.36	"	0.42	0.04	0.65	0.37	0.56	0.20
20.....	0.39	0.01	0.43	0.05	0.68	0.44	0.58	0.23
21.....	Dry.	Nil.	0.41	0.03	0.65	0.37	0.60	0.26
22.....	"	"	0.43	0.05	0.63	0.33	0.54	0.18
23.....	0.36	"	0.46	0.08	0.60	0.26	0.55	0.19
24.....	0.36	"	0.48	0.10	0.62	0.30	0.60	0.26
25.....	0.36	"	0.46	0.08	0.60	0.26	0.58	0.23
26.....	Dry.	"	0.47	0.09	0.58	0.23	0.56	0.20
27.....	"	"	0.45	0.07	0.53	0.16	0.55	0.19
28.....	"	"	0.49	0.11	0.50	0.12	0.58	0.23
29.....	"	"	0.52	0.15	0.48	0.10	0.55	0.19
30.....	"	"	0.55	0.19	0.47	0.09	0.54	0.18
31.....	"	"	0.57	0.22	.....	.....	0.55	0.19

MONTHLY DISCHARGE of Bridge Creek at Raymond's Ranch, for 1914.

(Drainage area 6 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March.....	23.00	0.32	10.60	1.760	2.030	651
April.....	3.50	0.20	1.53	0.256	0.290	91
May.....	0.46	.....	0.19	0.031	0.040	11
June.....	0.23	.....	0.14	0.023	0.030	8
July.....	0.10	.....	0.02	0.003	0.003	1
August.....	0.22	.....	0.04	0.007	0.008	3
September.....	3.30	0.09	0.38	0.063	0.070	23
October.....	7.30	0.10	1.07	0.180	0.210	66
The period.....	.....	.....	.....	.....	2,687	854

BRIDGE CREEK NEAR SKULL CREEK.

Location.—On the NW. $\frac{1}{4}$ Sec. 12, Tp. 11, Rge. 22, W. 3rd Mer., near Skull Creek post office.

Records available.—August 1, 1909, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 87.51 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter at high stages, and with weir at ordinary stages.

Winter flow.—This station is not maintained during the winter.

Observer.—J. Mann.

DISCHARGE MEASUREMENTS of Bridge Creek near Skull Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 20.....	H. O. Brown.....				1.45	0.65 ^a
April 1.....	do.....	20.2	31.10	0.69	3.18	22.00
April 11.....	do.....	8.1	4.20	0.44	1.82	1.84
April 24.....	F. R. Steinberger.....				1.52	0.68 ^b
May 16.....	do.....				1.07	Nil.
June 15.....	do.....					"
July 6.....	do.....					"
July 29.....	do.....					"
Sept. 8.....	E. W. W. Hughes.....					"
Sept. 28.....	do.....					"
Nov. 4.....	do.....				0.94	0.05 ^a

^a Discharge estimated.

^b Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bridge Creek near Skull Creek, for 1914.

DAY.	March.		April.		May.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.18	22.00	1.36	0.39
2.....			2.30	6.30	1.35	0.38
3.....			2.20	5.10	1.25	0.25
4.....			2.50	9.40	1.18	0.19
5.....			2.35 ^b	7.00	1.20	0.20
6.....			2.20	5.10	1.44	0.53
7.....			1.94	2.60	1.40	0.45
8.....			1.78	1.65	1.39	0.44
9.....			1.70	1.25	1.35	0.38
10.....			1.52	0.70	1.34 ^b	0.36
11.....			1.82	1.87	1.34	0.36
12.....			1.86 ^b	2.10	1.34	0.36
13.....	3.83	33.00	1.90	2.40	1.29	0.29
14.....	4.44	44.00	1.92	2.50	1.26	0.26
15.....	3.98	36.00	2.00	3.10	1.20	0.20
16.....	3.70	31.00	2.14	4.40	1.07	0.14
17.....	3.20	22.00	1.80	1.75	1.05 ^b	0.12
18.....	2.35	7.00	1.75	1.50	1.04	0.12
19.....	1.74	1.45	1.76 ^b	1.55	1.02	0.11
20.....	1.45	0.55	1.78	1.65	0.98	0.09
21.....	1.45	0.55	1.77	1.60	0.94	0.07
22.....	1.38	0.46	1.80	1.75	0.90	0.05
23.....	1.34 ^a	0.36	1.62	0.97	0.85	0.02
24.....		Nil.	1.52	0.70	0.81 ^b	Nil.
25.....		"	1.48	0.61	0.78	"
26.....		"	1.49 ^b	0.63	0.77	"
27.....		"	1.50	0.65	0.77	"
28.....		"	1.46	0.57	0.76	"
29.....		"	1.37	0.40	0.76	"
30.....		"	1.37	0.40	Dry ^c	"
31.....	2.69	12.70				

^a to ^a Channel frozen.

^b Gauge height interpolated.

^c Dry to Oct. 31.

MONTHLY DISCHARGE of Bridge Creek near Skull Creek, for 1914.

(Drainage area 15 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	44.00	0.00	10.00	0.663	0.47	375
April.....	22.00	0.40	3.10	0.205	0.23	183
May.....	0.53	0.00	0.19	0.012	0.01	11
June.....						Nil.
July.....						"
August.....						"
September.....						"
October.....						"
The period.....					0.71	569

BRIDGE CREEK AT GULL LAKE.

Location.—On highway bridge on the SE. $\frac{1}{4}$ Sec. 23, Tp. 13, Rge. 19, W. 3rd Mer., near the Canadian Pacific Railway station.

Records available.—March 29, 1911, to December 31, 1914.

Gauge.—Staff; zero of gauge has been maintained at 95.63 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge, or by wading, at station.

Winter flow.—No winter observations have been taken.

Observer.—J. R. Gaskell.

DISCHARGE MEASUREMENTS of Bridge Creek at Gull Lake, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 18.....	F. R. Steinberger.....	3.9	1.26	0.21	0.75	0.29
Mar. 18.....	do.....	13.0	5.07	0.66	1.05	3.35
May 5.....	W. H. Storey.....				Dry.	Nil.
June 13.....	do.....	12.0	6.60	0.22	0.65	1.45
July 8.....	do.....				Dry.	Nil.
Aug. 4.....	do.....				"	"
Sept. 4.....	do.....				"	"

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DAILY GAUGE HEIGHT AND DISCHARGE of Bridge Creek at Gull Lake, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.14		Dry.	Nil.	Dry.	Nil.
2.....			1.24		"	"	"	"
3.....			1.02		"	"	"	"
4.....			1.01 ^a		"	"	"	"
5.....			1.00	5.50 ^c	"	"	"	"
6.....			0.96	4.90	"	"	"	"
7.....			0.95	4.80	"	"	"	"
8.....			0.75	2.40	"	"	"	"
9.....			0.63	1.44	"	"	"	"
10.....			0.56	1.12	"	"	"	"
11.....			0.52	0.84	"	"	1.59	21.00
12.....			0.47	0.58	"	"	0.70	2.00
13.....			0.42	0.38	"	"	0.44	0.46
14.....			0.36	0.22	"	"	Dry.	Nil.
15.....			0.31	0.12	"	"	"	^d
16.....			0.28	Nil.	"	"	"	"
17.....			0.27	"	"	"	"	"
18.....	0.66	^b	0.24	"	"	"	"	"
19.....	0.85		0.24	"	"	"	"	"
20.....	0.85		0.33	0.16	"	"	"	"
21.....	0.78		0.34	0.18	"	"	"	"
22.....	0.80		0.30	0.10	"	"	"	"
23.....	0.80		0.30	Nil.	"	"	"	"
24.....	0.80		0.28	"	"	"	"	"
25.....	0.82 ^a		0.28	"	"	"	"	"
26.....	0.84 ^a		0.34	0.18	"	"	"	"
27.....	0.86 ^a		0.32	0.14	"	"	"	"
28.....	0.88 ^a		0.29	Nil.	"	"	"	"
29.....	0.90 ^a		0.26	"	"	"	"	"
30.....	0.92		0.24	"	"	"	"	"
31.....	0.93				"	"	"	"

^a Interpolated.^b to ^c Ice conditions—insufficient data to compute discharge.^d Creek dry from June 14 to end of year.

MONTHLY DISCHARGE of Bridge Creek at Gull Lake, for 1914.

(Drainage area 213 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	5.5		0.77	0.0036	0.004	46
May.....						Nil.
June.....	21.0		0.78	0.0037	0.004	46
July.....						Nil.
August.....						"
September.....						"
October.....						"
The period.....					0.008	92

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Antelope Lake drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Dis-charge.
				<i>Sec.-ft.</i>
April 30.....	M. H. French	Spring No. 2	NE. 27-12-19-3	0.072
May 11.....	do	do 1.	NW. 32-12-18-3	0.124
May 11.....	do	do 2.	NE. 27-12-19-3	0.065
May 11.....	do	do 2.	NE. 27-12-19-3	0.071
May 11.....	do	do 2.	NE. 27-12-19-3	0.074
May 11.....	do	do 3.	SW. 27-12-19-3	0.020
June 15.....	W. H. Storey	do 1.	NW. 32-12-18-3	0.103
June 15.....	do	do 2.	NE. 27-12-19-3	0.065
June 15.....	do	do 3.	SW. 27-12-19-3	0.004
July 8.....	do	do 1.	NW. 32-12-18-3	0.010
July 8.....	do	do 2.	NE. 27-12-19-3	0.041
July 8.....	do	do 3.	SW. 27-12-19-3	Nil.
Aug. 5.....	do	do 1.	NW. 32-12-18-3	"
Aug. 5.....	do	do 2.	NE. 27-12-19-3	0.018
Aug. 5.....	do	do 3.	SW. 27-12-19-3	Nil.
Sept. 4.....	do	do 1.	NW. 32-12-18-3	0.020
Sept. 4.....	do	do 2.	NE. 27-12-19-3	0.064
Sept. 4.....	do	do 3.	SW. 27-12-19-3	Nil.
Nov. 25.....	J. E. Caughey.	do 1.	NW. 32-12-18-3	0.180
Nov. 26.....	do	do 2.	NE. 27-12-19-3	0.079
Nov. 26.....	do	do 3.	SW. 27-12-19-3	Nil.
Dec. 19.....	do	do 1.	NW. 32-12-18-3	0.161
Dec. 19.....	do	do 3.	SW. 27-12-19-3	Nil.
Dec. 20.....	do	do 2.	NE. 27-12-19-3	0.094

NOTE.—All the above are weir measurements.

LAKE OF THE NARROWS DRAINAGE BASIN.

Description.

Lake of the Narrows is a small lake, three miles long and one and a half miles wide, in Township 3, Range 23, West of the 3rd Meridian. It has a drainage area of about 200 square miles.

The principal stream in the basin is Skull Creek, which rises in the eastern slope of Cypress Hills. It flows through a narrow valley for the greater part of its course, but, as it nears the lake, the valley widens out into large meadows. The surrounding country is rolling prairie.

In very dry years, such as 1910 and 1914, Skull Creek goes dry for a short time. The mean annual precipitation in the drainage basin is about 13 inches.

SKULL CREEK AT DOYLE'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 29, Tp. 10, Rge. 22, W. 3rd Mer., near Skull Creek post office.

Records available.—April 8, 1911, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge was maintained at 87.20 feet during 1911; 86.82 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter, and with weir at low stages.

Winter flow.—This station is not maintained during the winter.

Artificial control.—A control for the gauge was constructed at this station during August, 1913, and is still in good repair. The flood of April did very little damage to the control itself, but washed the east bank behind the abutment. This was repaired on April 24th.

Observer.—Thos. Doyle.

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DISCHARGE MEASUREMENTS of Skull Creek at Doyle's Ranch, for 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 19.....	H. O. Brown.....	12.0	6.11	1.03	2.10	6.30
Mar. 23.....	do.....	8.6	3.88	0.75	1.96	2.80
Mar. 30.....	do.....	8.5	3.31	0.67	1.82	2.20
April 1.....	do.....	16.2	19.00	2.18	2.59	41.40
April 2.....	do.....	14.4	12.80	1.65	2.34	21.00
April 11.....	do.....	10.5	6.32	1.59	1.99	10.00
April 24.....	F. R. Steinberger.....	15.3	7.79	0.73	1.84	5.70
May 16.....	do.....	14.3	6.57	0.44	1.84	2.90
June 16.....	do.....	14.9	5.96	0.27	1.75	1.60
July 6.....	do.....				1.66	0.30a
July 29.....	do.....					Nil.
Sept. 7.....	E. W. W. Hughes.....				1.64	0.17a
Sept. 29.....	do.....				1.71	0.33a
Nov. 4.....	do.....				1.77	0.83a

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Skull Creek at Doyle's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.59	41.0	1.93	5.50	1.72a	1.10
2.....			2.34	23.0	1.94	5.80	1.70	0.80
3.....			2.39	26.0	1.94a	5.80	1.70a	0.80
4.....			2.34	23.0	1.94	5.80	1.71a	0.95
5.....			2.74	55.0	1.95	6.10	1.71	0.95
6.....			2.49	32.0	1.96	6.40	1.72	1.10
7.....			2.44	29.0	2.10	10.60	1.73	1.25
8.....			2.39	26.0	2.05	9.00	1.71	0.95
9.....			2.17a	16.1	2.04	8.70	1.70	0.80
10.....			1.96	9.1	2.06	9.30	1.72	1.10
11.....			2.01	10.5	2.00a	7.50	1.72	1.10
12.....			2.29	21.0	1.95	6.10	1.73	1.25
13.....	2.30	2.0b	2.24a	18.7	1.94	5.80	1.73	1.25
14.....	2.10	3.0	2.19a	16.8	1.90	4.70	1.74a	1.40
15.....	2.18a	4.0	2.13	14.7	1.87a	4.00	1.76	1.73
16.....	2.24a	5.0	2.08	12.9	1.84	3.30	1.75	1.55
17.....	2.30	6.0	1.98	9.6	1.82	2.90	1.70	0.80
18.....	2.20a	6.0	1.93	8.2	1.84	3.30	1.71	0.95
19.....	2.10	6.3	1.97a	9.4	1.85	3.50	1.72	1.10
20.....	2.00	5.0	2.01	10.5	1.91	5.00	1.72	1.10
21.....	2.10	4.0	1.98	9.6	1.82	2.90	1.73	1.25
22.....	1.96	3.0	1.93	8.2	1.85	3.50	1.72	1.10
23.....	1.96	2.8	1.87	6.6	1.82	2.90	1.71a	0.95
24.....	1.90	2.0	1.92	8.0	1.82	2.90	1.70	0.80
25.....		2.0	1.86	3.7	1.80	2.40	1.70	0.80
26.....	2.0		1.96	6.4	1.78a	2.10	1.70	0.80
27.....	2.0		1.98	6.9	1.76	1.73	1.68	0.58
28.....	2.0		1.97	6.7	1.75	1.55	1.65	0.25
29.....	1.83	2.0	1.93	5.5	1.74	1.40	1.65	0.25
30.....	1.82	2.2b	1.96	6.4	1.74	1.40	1.65	0.25
31.....	2.70	51.0			1.72a	1.10		

a Gauge height interpolated.

b Ice conditions March 13 to 30; discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Skull Creek at Doyle's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.64a	0.20	Dry.	Nil.	1.71a	0.95	1.72	1.10
2.....	1.64	0.20	"	"	1.70	0.80	1.72	1.10
3.....	1.64a	0.20	"	"	1.70	0.80	1.72	1.10
4.....	1.64a	0.20	"	"	1.78	2.10	1.78a	2.10
5.....	1.64	0.20	"	"	1.77a	1.91	1.85	3.50
6.....	1.66	0.36	"	"	1.76a	1.73	1.90	4.70
7.....	1.66a	0.36	"	"	1.65	0.25	2.10	10.60
8.....	1.66a	0.36	"	"	1.65	0.25	2.35	20.00
9.....	1.66	0.36	"	"	1.65	0.25	2.40	23.00
10.....	1.64	0.20	"	"	1.65a	0.25	2.35	20.00
11.....	1.64	0.20	"	"	1.65	0.25	2.12a	11.30
12.....	1.64	0.20	"	"	1.65a	0.25	1.90	4.70
13.....	1.64	0.20	"	"	1.95	6.10	1.90	4.70
14.....	1.64a	0.20	"	"	2.00	7.50	1.87a	4.00
15.....	1.64a	0.20	"	"	1.86	3.70	1.85	3.50
16.....	1.64	0.20	"	"	1.80	2.40	1.80	2.40
17.....	1.64	0.20	"	"	1.75	1.55	1.80a	2.40
18.....	1.64	0.20	"	"	1.75	1.55	1.80	2.40
19.....	1.65	0.25	"	"	1.72	1.10	1.82	2.90
20.....	Dry.	Nil.	"	"	1.74	1.40	1.80	2.40
21.....	"	"	"	"	1.72	1.10	1.78	2.10
22.....	"	"	"	"	1.72	1.10	1.75	1.55
23.....	"	"	"	"	1.72a	1.10	1.75	1.55
24.....	"	"	"	"	1.72	1.10	1.75	1.55
25.....	"	"	1.64	0.20	1.72a	1.10	1.75	1.55
26.....	"	"	1.65	0.25	1.71a	0.95	1.75	1.55
27.....	"	"	1.65	0.25	1.70a	0.80	1.75	1.55
28.....	"	"	1.68	0.58	1.70	0.80	1.75	1.55
29.....	"	"	1.68	0.58	1.71	0.95	1.75	1.55
30.....	"	"	1.80	2.40	1.71	0.95	1.75	1.55
31.....	"	"	1.73	1.25	.....	.....	1.75	1.55

a Gauge height interpolated.

MONTHLY DISCHARGE of Skull Creek at Doyle's Ranch, for 1914.

(Drainage area 19 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	51.00	2.00	5.91	0.311	0.220	223
April.....	55.00	3.70	16.02	0.843	0.940	952
May.....	10.60	1.10	4.60	0.243	0.280	283
June.....	1.73	0.25	0.97	0.051	0.060	58
July.....	0.36	.....	0.14	0.008	0.009	9
August.....	2.40	.....	0.18	0.009	0.010	11
September.....	7.50	0.25	1.50	0.079	0.090	80
October.....	23.00	1.10	4.70	0.247	0.280	280
The period.....	1.889	1,914

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SKULL CREEK NEAR SKULL CREEK.

Location.—On the NW. $\frac{1}{4}$ Sec. 10, Tp. 11, Rge. 22, W. 3rd Mer., near Skull Creek post office.
Records available.—July 1, 1908, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 88.41 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter, and by weir at low stages.

Winter flow.—This station is not maintained during the winter.

Observer.—J. Mann.

DISCHARGE MEASUREMENTS of Skull Creek near Skull Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 20.	H. O. Brown.	9.7	11.20	0.37	2.57	4.10
April 1.	do	37.7	63.20	0.80	4.56	51.00
April 11.	do	10.4	13.30	0.69	1.73	9.20
April 24.	F. R. Steinberger.	10.0	6.79	0.63	1.06	4.30
May 16.	do	7.5	3.93	0.57	0.74	2.20
June 15.	do				0.70	1.35a
July 7.	do					Nil.
July 20.	do					"
Sept. 8.	E. W. W. Hughes					"
Sept. 28.	do				0.32	0.22a
Nov. 4.	do	8.1	3.78	0.34	0.62	1.28

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Skull Creek near Skull Creek, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			4.56	46.0	0.84	2.50	0.43	0.62
2.			3.57	30.0	0.82	2.40	0.42	0.58
3.			3.32	27.0	0.81	2.40	0.50	0.90
4.			3.72	35.0	0.80	2.30	0.65	1.55
5.			3.57b	33.0	0.82	2.40	0.70	1.80
6.			3.42	31.0a	0.86	2.70	0.78	2.20
7.			2.96	24.0	0.87	2.70	0.54	1.06
8.			3.46	32.0	0.84	2.50	0.52	0.98
9.			2.12	13.2	0.84	2.50	0.56	1.14
10.			2.06	12.6	0.84b	2.50	0.60	1.30
11.			1.72	9.2	0.85	2.60	0.60	1.30
12.			1.71b	9.1	0.84	2.50	0.61	1.35
13.	3.86	15.90a	1.70	9.0	0.83	2.50	0.62	1.40
14.	4.61	26.00	1.71	9.1	0.82	2.40	0.70	1.80
15.	3.90	16.50	1.63	8.4	0.82	2.40	0.70	1.80
16.	3.12	8.40	1.55	7.6	0.86	2.70	0.67	1.65
17.	3.02	7.60	1.62	8.3	0.78b	2.20	0.65	1.55
18.	2.82	5.90	1.27	5.4	0.70	1.80	0.64	1.50
19.	2.13	1.60	1.34b	5.9	0.69	1.75	0.60	1.30
20.	2.57	4.10	1.42	6.6	0.67	1.65	0.55	1.10
21.	2.52	5.20	1.43	6.6	0.67	1.65	0.51b	0.94
22.	2.34b	5.60	1.32	5.8	0.66	1.60	0.48	0.82
23.	2.16	5.00	1.17	4.7	0.65	1.55	0.48	0.82
24.	c		1.06	3.9	0.62b	1.40	0.48	0.82
25.			1.09	4.1	0.60	1.30	0.48	0.82
26.			1.17	4.7	0.59	1.26	0.48	0.82
27.			1.12	4.3	0.59	1.26	0.48	0.82
28.			1.02	3.6	0.54	1.06	0.49b	0.86
29.			0.86	2.7	0.54	1.06	0.50	0.90
30.			0.86	2.7	0.52	0.98	0.48	0.82
31.	3.69	30.00			0.47b	0.80		

a to a Ice conditions.

b Gauge height interpolated.

c to c Channel frozen.

DAILY GAUGE HEIGHT AND DISCHARGE of Skull Creek near Skull Creek, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.46 _a	0.74	Dry.	Nil.	Dry.	Nil.	0.37	0.41
2.....	0.45	0.70	"	"	"	"	0.37	0.41
3.....	0.40	0.50	"	"	"	"	0.52	0.98
4.....	Dry.	Nil.	"	"	"	"	0.72 _a	1.90
5.....	"	"	"	"	"	"	0.92	3.00
6.....	"	"	"	"	"	"	0.90	2.90
7.....	"	"	"	"	"	"	1.39	6.30
8.....	"	"	"	"	"	"	2.85	22.00
9.....	"	"	"	"	"	"	2.50	17.60
10.....	"	"	"	"	"	"	1.57	7.80
11.....	"	"	"	"	"	"	1.55 _a	7.60
12.....	"	"	"	"	"	"	1.53	7.50
13.....	"	"	"	"	1.55	7.60	1.50	7.20
14.....	"	"	"	"	1.12	4.30	1.48	7.00
15.....	"	"	"	"	0.70	1.80	1.42	6.60
16.....	"	"	"	"	0.57	1.18	1.10	4.20
17.....	"	"	"	"	0.49	0.86	0.69	1.75
18.....	"	"	"	"	0.48	0.82	0.67	1.65
19.....	"	"	"	"	0.48	0.82	0.65	1.55
20.....	"	"	"	"	0.46 _a	0.74	0.64	1.50
21.....	"	"	"	"	0.45	0.70	0.64	1.50
22.....	"	"	"	"	0.40	0.50	0.63	1.45
23.....	"	"	"	"	0.34	0.32	0.60	1.30
24.....	"	"	"	"	0.34	0.32	0.60	1.30
25.....	"	"	"	"	0.35	0.35	0.59	1.26
26.....	"	"	"	"	0.38	0.44	0.58	1.22
27.....	"	"	"	"	0.36	0.38	0.58	1.22
28.....	"	"	"	"	0.39	0.47	0.58	1.22
29.....	"	"	"	"	0.38	0.44	0.59 _a	1.26
30.....	"	"	"	"	0.38	0.44	0.60	1.30
31.....	"	"	"	"	"	"	0.64	1.50

_a Gauge height interpolated.

MONTHLY DISCHARGE of Skull Creek near Skull Creek, for 1914.

(Drainage area 32 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Acre-feet.
March (13-31).....	30.00	.....	6.90	0.217	0.150	261
April.....	46.00	2.70	13.50	0.422	0.470	803
May.....	2.70	0.80	1.98	0.062	0.070	122
June.....	2.20	0.58	1.18	0.037	0.040	70
July.....	0.74	.....	0.06	0.002	0.002	4
August.....	.....	.....	.....	.....	.....	Nil.
September.....	7.60	0.75	0.023	0.030	45
October.....	22.00	0.41	4.00	0.125	0.140	247
The period.....	0.902	1,552

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CRANE LAKE DRAINAGE BASIN.

General Description.

Crane Lake is one of the largest of the lakes which receive their supply from the drainage of the northern slope of the Cypress Hills. It is situated in Township 13, Range 23, West of the 3rd Meridian, and covers an area of 25 square miles.

The lake has no outlet, is shallow, and the water is saline in character. It is fed by Piapot Creek, which rises in the Cypress Hills, flows northeastward, and is joined by the Bear Creek in Section 7, Township 12, Range 22, West of the 3rd Meridian, before it reaches the lake.

The country to the north of the lake is rolling and of little use for agriculture, being the eastern end of a range of sandhills which extend northwestward some 40 miles. South of the lake the country is rolling prairie, which is bare of tree growth except along the creeks, where there is a small growth of willow and shrub. As it gets closer to the hills the country becomes more broken and the tree growth increases, making the ravines and coulees at the head of the creeks natural reservoirs, which regulate the spring run-off considerably.

There are a number of irrigation schemes, in operation and proposed, in this basin, also one or two industrial schemes along the main line of the Canadian Pacific Railway.

The mean annual precipitation of the northern part of the basin is about 12 inches, but in the hills this is exceeded. During the winter season, from November to April, the streams are frozen over.

EAST BRANCH OF BEAR CREEK AT JOHNSON'S RANCH.

Location.—On the SE. $\frac{1}{4}$ Sec. 21, Tp. 10, Rge. 23, W. 3rd Mer.

Records available.—August 18th, 1909, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge was maintained at 92.63 feet during 1909, 1910, 1911, 1913 and 1914, and at 92.26 feet during 1912.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter, and with weir at low stages.

Winter flow.—This station is not maintained during the winter.

Observer.—T. Johnson.

DISCHARGE MEASUREMENTS of East Branch of Bear Creek at Johnson's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 18.	H. O. Brown.	12.2	7.70	0.92	1.45	7.20 _a
Mar. 23.	do.	10.6	4.89	0.76	1.39	3.70 _a
Mar. 30.	do.	8.8	3.86	0.78	3.51	3.00 _a
April 2.	do.	15.1	13.05	2.01	1.71	26.00
April 13.	do.	14.3	12.90	1.88	1.68	24.00
April 23.	F. R. Steinberger.	11.0	7.88	0.66	1.26	5.20
May 15.	do.	10.2	4.41	0.69	1.16	3.00
June 15.	do.	6.9	2.41	0.69	1.12	1.65
July 4.	do.				0.85	1.52 _b
July 28.	do.					Nil.
Sept. 27.	E. W. W. Hughes.				0.92	0.72 _b
Nov. 5.	do.	10.7	4.00	0.49	1.09	1.96

a Ice conditions.

b Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Bear Creek at Johnson's Ranch,
for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1			1.96	10.0	1.21	4.0	1.18	3.40
2			2.08	26.0	1.22	4.3	1.17	3.30
3			2.00	35.0	1.20	3.8	1.15	2.90
4			1.94	40.0 ^a	1.23	4.5	1.19	3.60
5			2.08	47.0	1.24	4.8	1.21	4.00
6			1.94	39.0	1.21	4.0	1.23	4.50
7			1.78	30.0	1.27	5.6	1.21	4.00
8			1.76	29.0	1.25	5.0	1.20	3.80
9			1.74	28.0	1.26	5.3	1.19	3.60
10			1.77	29.0	1.24	4.8	1.20	3.80
11			1.76	29.0	1.23	4.5	1.18	3.40
12			1.86	34.0	1.23	4.5	1.21	4.00
13			1.53	16.4	1.23	4.5	1.20	3.80
14			1.51	15.4	1.22	4.3	1.18	3.40
15			1.52	15.9	1.20	3.8	1.16	3.00
16			1.48	13.8	1.22	4.3	1.12	2.40
17			1.37	8.9	1.21	4.0	1.10	2.10
18	1.43	6.4 ^a	1.35	8.1	1.22	4.3	1.08	1.90
19	1.61	13.3	1.33	7.9	1.23	4.5	1.07	1.80
20	1.61	12.8	1.35	8.1	1.24	4.8	1.07	1.80
21	1.52	8.6	1.36	8.5	1.22	4.3	1.08	1.90
22	1.52	7.8	1.28	5.8	1.21	4.0	1.06	1.70
23	1.42	4.4	1.29	6.1	1.22	4.3	1.05	1.60
24	1.39	3.5	1.27	5.6	1.22	4.3	1.02	1.30
25	1.49	3.5	1.24	4.8	1.22	4.3	1.04	1.50
26	1.46	3.0	1.28	5.8	1.22	4.3	1.03	1.40
27	1.44	3.0	1.25	5.0	1.21	4.0	1.05	1.60
28	1.46	3.0	1.26	5.3	1.20	3.8	1.07	1.80
29	1.48	3.0	1.25	5.0	1.20	3.8	1.08	1.90
30	1.85	3.0	1.23	4.5	1.18	3.4	1.06	1.70
31	2.04	3.0			1.18	3.4		

^a Ice conditions March 18 to April 4; discharge estimated.

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DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Bear Creek at Johnson's Ranch, for 1914.

MONTH.	July.		August.		September.		October	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.02	1.30	Dry.	Nil.	0.87	0.38	1.00	1.10
2.....	1.03	1.40	"	"	0.88	0.42	1.03	1.40
3.....	1.01	1.20	"	"	0.87	0.38	1.08	1.90
4.....	1.01	1.20	"	"	0.84	0.26	1.18	3.40
5.....	1.00	1.10	"	"	0.86	0.34	1.15	2.90
6.....	1.09	2.00	"	"	0.88	0.42	1.18	3.40
7.....	0.97	0.86	"	"	0.89	0.46	1.20	3.80
8.....	0.95	0.70	"	"	0.90	0.50	1.37	8.90
9.....	0.92	0.58	"	"	0.92	0.58	1.84	33.00
10.....	0.85	0.30	"	"	0.91	0.54	1.50	14.80
11.....	0.85	0.30	"	"	0.93	0.62	1.22	4.30
12.....	0.83	0.22	"	"	0.94	0.66	1.21	4.00
13.....	0.81	0.14	"	"	0.88	0.42	1.16	3.00
14.....	Dry.	Nil.	"	"	0.85	0.30	1.20	3.80
15.....	0.75	"	"	"	0.83	0.22	1.19	3.60
16.....	0.85	0.30	"	"	0.78	0.06	1.21	4.00
17.....	0.82	0.18	"	"	0.73	Nil.	1.18	3.40
18.....	0.78	0.06	"	"	0.71	"	1.16	3.00
19.....	0.75	Nil.	"	"	0.73	"	1.15	2.90
20.....	Dry.	"	"	"	0.73	"	1.18	3.40
21.....	"	"	"	"	0.70	"	1.19	3.60
22.....	"	"	"	"	0.66	"	1.17	3.30
23.....	"	"	"	"	0.63	"	1.19	3.60
24.....	"	"	"	"	0.60	"	1.18	3.40
25.....	"	"	0.92	0.58	0.90	0.50	1.16	3.00
26.....	"	"	0.90	0.50	1.01	1.20	1.17	3.30
27.....	"	"	0.85	0.30	1.02	1.30	1.18	3.40
28.....	"	"	0.85	0.30	1.00	1.10	1.16	3.00
29.....	"	"	0.81	0.14	0.97	0.86	1.17	3.30
30.....	"	"	0.83	0.22	0.98	0.94	1.16	3.00
31.....	"	"	0.89	0.46			1.18	3.40

MONTHLY DISCHARGE of East Branch of Bear Creek at Johnson's Ranch, for 1914.
(Drainage area 22 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (18-31).....	13.30	3.00	5.60	0.254	0.130	155
April.....	47.00	4.50	17.60	0.800	0.890	1,047
May.....	5.60	3.40	4.30	0.195	0.220	264
June.....	4.50	1.30	2.70	0.122	0.140	161
July.....	2.00	.....	0.38	0.017	0.020	23
August.....	0.58	.....	0.08	0.004	0.005	5
September.....	1.30	.....	0.42	0.019	0.020	25
October.....	33.00	1.10	4.70	0.214	0.250	290
The period.....					1.675	1,970

WEST BRANCH OF BEAR CREEK AT BERTRAM'S RANCH.

Location.—On the SW. $\frac{1}{4}$ of Sec. 32, Tp. 10, Rge. 23, W. 3rd Mer.*Records available.*—September 16, 1909, to October 31, 1914.*Gauge.*—Vertical staff; the elevation of the zero of the gauge has been maintained at 92.25 feet since establishment.*Bench-mark.*—Permanent iron bench-mark; assumed elevation, 100.00 feet.*Channel.*—Slightly shifting.*Discharge measurements.*—Made with meter, and with weir at very low stages.*Winter flow.*—This station is not maintained during the winter.*Observer.*—R. McKenzie and W. L. Taylor.

DISCHARGE MEASUREMENTS of West Branch of Bear Creek at Bertram's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 18.....	H. O. Brown.....	13.1	11.40	1.63	1.57	18.60
Mar. 23.....	do.....	11.5	7.02	1.05	1.29	7.40
Mar. 30.....	do.....	11.8	8.21	1.07	1.41	8.80
April 2.....	do.....	15.1	16.10	2.32	1.77	37.00
April 13.....	do.....	16.2	16.80	2.16	1.76	36.00
April 23.....	F. R. Steinberger.....	12.3	8.86	1.44	1.39	12.80
May 15.....	do.....	13.0	6.60	1.19	1.29	7.80
June 15.....	do.....	11.5	5.65	0.85	1.16	4.80
July 4.....	do.....				0.81	0.13 ^a
July 28.....	do.....				0.75	Nil.
Sept. 27.....	E. W. W. Hughes.....	8.0	2.40	0.60	1.03	1.43
Nov. 5.....	do.....	11.6	4.72	0.95	1.19	4.50

^a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of West Branch of Bear Creek at Bertram's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.87	42.0	1.35	10.5	1.13	4.00
2.....			1.77	37.0 ^a	1.35	10.5	1.13	4.00
3.....			1.68	30.0	1.35	10.5	1.13	4.00
4.....			2.16	69.0	1.37	11.4	1.15	4.40
5.....			1.96	52.0	1.40	12.7	1.14	4.20
6.....			1.91	48.0	1.35	10.5	1.18	5.10
7.....			1.51	18.6	1.33	9.8	1.16	4.60
8.....			1.44	14.7	1.32	9.4	1.15	4.40
9.....			1.40	12.7	1.44	14.7	1.13	4.00
10.....			1.33	9.8	1.39	12.3	1.17	4.90
11.....			1.29	8.4	1.36	10.9	1.15	4.40
12.....			1.44	14.7	1.33	9.8	1.16	4.60
13.....			1.70	32.0	1.32	9.4	1.14	4.20
14.....			1.85	44.0	1.32	9.4	1.15 ^c	4.40
15.....			1.70	32.0	1.31	9.1	1.16	4.60
16.....			1.50	18.0	1.31	9.1	1.15	4.40
17.....			1.45	15.2	1.31	9.1	1.14	4.20
18.....	1.55	17.6 ^a	1.45	15.2	1.30	8.7	1.13	4.00
19.....	1.84	39.0	1.44	14.7	1.30	8.7	1.13	4.00
20.....	1.79	36.0	1.49	17.4	1.32	9.4	1.13	4.00
21.....	1.69	25.0	1.44	14.7	1.31	9.1	1.13	4.00
22.....	1.59	22.0	1.41	13.2	1.29	8.4	1.13	4.00
23.....	1.28	7.4	1.40	12.7	1.25	7.0	1.13	4.00
24.....	1.19	4.6	1.40	12.7	1.23	6.4	1.13	4.00
25.....	^b		1.40	12.7	1.21	5.9	1.13	4.00
26.....			1.40	12.7	1.19	5.4	1.14	4.20
27.....			1.40	12.7	1.16	4.6	1.13	4.00
28.....			1.40	12.7	1.14	4.2	1.05	2.60
29.....	^b		1.40	12.7	1.13	4.0	1.00	1.80
30.....	1.39	8.0	1.37	11.4	1.13	4.0	0.95	1.20
31.....	1.77	36.0			1.13	4.0		

^a to ^a Ice conditions.^b to ^b Channel frozen.^c Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of West Branch of Bear Creek at Bertram's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.90	0.70	Dry.	Nil.	Dry.	Nil.	1.07	2.1
2.....	0.86	0.46	"	"	"	"	1.07	2.1
3.....	0.81	0.16	"	"	"	"	1.10	2.6
4.....	0.81	0.16	"	"	"	"	1.22	5.2
5.....	0.80	0.10	"	"	"	"	1.27	6.6
6.....	0.80	1.10	"	"	"	"	1.24	5.7
7.....	0.79	0.08	"	"	"	"	1.35	9.3
8.....	0.79	0.08	"	"	"	"	1.79	35.0
9.....	0.78	0.06	"	"	"	"	1.66	25.0
10.....	0.77	0.01	"	"	"	"	1.55	18.7
11.....	0.76	0.02	"	"	"	"	1.42	12.1
12.....	0.76	0.02	"	"	"	"	1.37	10.1
13.....	0.76	0.02	"	"	"	"	1.34	8.0
14.....	0.75	Nil.	"	"	"	"	1.32	8.3
15.....	0.75	"	"	"	"	"	1.29	7.2
16.....	0.75	"	"	"	"	"	1.28	6.9
17.....	0.75	"	"	"	"	"	1.26	6.3
18.....	0.75	"	"	"	"	"	1.24	5.7
19.....	0.75	"	"	"	"	"	1.23	5.5
20.....	0.75	"	"	"	"	"	1.23	5.5
21.....	0.75	"	"	"	"	"	1.23	5.5
22.....	0.75	"	"	"	"	"	1.23	5.5
23.....	0.75	"	"	"	"	"	1.22	5.2
24.....	0.75	"	"	"	"	"	1.22	5.2
25.....	0.75	"	"	"	"	"	1.21	5.0
26.....	0.75	"	"	"	"	"	1.24	5.7
27.....	0.75	"	"	"	1.03	1.42	1.22	5.2
28.....	0.75	"	"	"	1.05	1.70	1.22	5.2
29.....	Dry.	"	"	"	1.05	1.70	1.21	5.0
30.....	"	"	"	"	1.06	1.88	1.21	5.0
31.....	"	"	"	"	"	"	1.20	4.7

a Stream commenced to flow about this date; no observer obtainable until September 27.

MONTHLY DISCHARGE of West Branch of Bear Creek at Bertram's Ranch, for 1914.

(Drainage area 45 square miles).

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet
March (18-31).....	39.00	.....	14.00	0.311	0.160	389
April.....	69.00	8.40	22.00	0.499	0.560	1,335
May.....	14.70	4.00	8.70	0.193	0.220	534
June.....	5.10	1.20	4.00	0.089	0.100	238
July.....	0.70	.....	0.07	0.001	0.001	4
August.....	.....	.....	.....	.....	.....	Nil.
September (1-11; 27-30).....	1.88	.....	1.68	0.037	0.006	13
October.....	35.00	2.10	7.90	0.176	0.200	483
The period.....	.....	.....	.....	.....	1.247	3,001

BEAR CREEK AT UNSWORTH'S RANCH.

Location.—On the SE. $\frac{1}{4}$ of Sec. 18, Tp. 11, Rge. 23, W. 3rd Mer.

Records available.—June 22, 1908, to October 1, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 85.95 feet since establishment.

Bench-mark.—A circle of nails in the top of the stringer at the left abutment of the bridge, on the downstream side; assumed elevation, 100.00 feet.

Discharge measurements.—Made with meter from the bridge; by wading, or with a weir, at very low stages.

Winter flow.—This station is not maintained during winter.

Artificial control.—Messrs. Needham Bros. have a dam below this station, but the back-water does not affect the station.

Observer.—S. Unsworth.

DISCHARGE MEASUREMENTS of Bear Creek at Unsworth's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. feet.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
March 17.....	H. O. Brown.....	12.5	33.80	1.15	4.29	39.00 _a
March 23.....	do.....	15.5	16.20	0.71	2.27	11.40 _a
March 30.....	do.....	6.8	14.40	1.04	2.15	15.00 _a
March 31.....	do.....	8.5	8.30	1.64	2.58	13.70 _a
April 1.....	do.....	8.4	12.70	2.04	4.33	26.00 _a
April 2.....	do.....	12.5	41.60	1.16	4.00	48.00
April 10.....	do.....	11.3	29.80	0.93	2.76	28.00
April 13.....	do.....	15.5	70.60	1.15	5.05	81.00
April 13.....	do.....	20.0	73.70	1.30	5.70	96.00
April 23.....	F. R. Steinberger.....	9.2	19.20	0.70	2.13	13.40
May 12.....	M. H. French.....	8.5	11.10	0.93	2.88	10.30
May 15.....	F. R. Steinberger.....	10.0	17.00	0.51	1.74	8.70
June 10.....	do.....	4.8	2.59	1.66	1.03	4.30
July 4.....	do.....	.....	.....	.....	0.80	0.88 _b
July 28.....	do.....	.....	.....	.....	0.56	Nil.
Sept. 27.....	E. W. W. Hughes.....	.....	.....	.....	1.35	0.44 _b
Nov. 5.....	do.....	12.5	8.10	0.62	1.75	5.00

a Ice conditions.

b Weir measurement.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Bear Creek at Unsworth's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.78	16.0	1.98	11.4	1.38	5.4
2.....			3.95	47.0	1.98	11.4	1.33	5.0
3.....			3.53	40.0a	1.98	11.4	1.33	5.0
4.....			4.03	52.0	1.98	11.4	1.28	4.7
5.....			5.83	101.0	1.98	11.4	1.23	4.3
6.....			5.68	96.0	2.03	12.1	1.53	6.6
7.....			3.83	47.0	2.08	12.7	1.43	5.8
8.....			3.53	40.0	2.33	16.5	1.38	5.4
9.....			3.23	33.0	2.23	14.9	1.33	5.0
10.....			3.13	31.0	2.18	14.1	1.15	3.8
11.....			2.63	21.0	2.13	13.4	1.15b	4.3
12.....	2.88	13.2a	4.58	66.0	2.06	12.5	1.13	4.2
13.....	4.18	36.0	5.36	87.0	2.03	12.1	1.20	5.4
14.....	6.83	105.0	3.90	48.0	1.98	11.4	1.25	5.6
15.....	7.23	117.0	3.56	40.0	1.93	10.8	1.30	6.0
16.....	8.63	159.0	3.38	36.0	1.88	10.2	1.25	5.5
17.....	4.29	39.0	3.03	29.0	1.83	9.6	1.15	4.6
18.....	3.93	35.0	2.53	19.7	1.78	9.0	1.10	4.2
19.....	3.53	28.0	2.45	18.1	1.76	8.8	1.05	3.8
20.....	3.33	26.0	2.38	17.3	1.73	8.5	1.05	3.6
21.....	3.13	22.0	2.28	15.7	1.73	8.5	1.00	3.2
22.....	2.63	16.2	2.18	14.1	1.71	8.3	1.00	3.0
23.....	2.27	11.4	2.13	13.4	1.68	8.0	0.95	2.6
24.....	2.18	11.0	2.08	12.7	1.63	7.5	0.95	2.4
25.....	2.13	11.0	2.08	12.7	1.63	7.5	0.95	2.3
26.....	2.13	11.6	2.08	12.7	1.58	7.0	1.00	2.7
27.....	2.18	12.8	2.03	12.1	1.58	7.0	1.00	2.6
28.....	2.18	13.8	2.03	12.1	1.53	6.6	1.05	2.8
29.....	2.23	15.2	1.98	11.4	1.48	6.2	1.10	2.9
30.....	2.15	15.0	1.98	11.4	1.43	5.8	1.05b	2.3
31.....	3.30	25.0			1.38	5.4		

a to a Ice conditions.

b to b Shifting conditions.

DAILY GAUGE HEIGHT AND DISCHARGE of Bear Creek at Unsworth's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Fect.</i>	<i>Sec.-ft.</i>	<i>Fect.</i>	<i>Sec.-ft.</i>	<i>Fect.</i>	<i>Sec.-ft.</i>	<i>Fect.</i>	<i>Sec.-ft.</i>
1.....	1.00 ^a	2.00	0.30	Nil.	0.30	Nil.	1.50	1.10
2.....	0.90	1.60	0.30	"	0.30	"	1.50	1.20
3.....	0.80	1.20	0.30	"	0.30	"	1.50	1.20
4.....	0.70	0.80	0.30	"	0.30	"	1.75	2.20
5.....	0.65	0.60	0.30	"	0.30	"	1.95	3.80
6.....	0.60	0.30	0.30	"	0.30	"	2.05	4.40
7.....	0.60	0.20	0.30	"	0.30	"	4.25	38.00
8.....	0.60	0.10	0.30	"	0.30	"	3.75	28.00
9.....	0.60	Nil.	0.30	"	0.30	"	3.10	17.60
10.....	0.60	"	0.30	"	0.30	"	2.65	11.40
11.....	0.60	"	0.30	"	0.30	"	2.35	8.00
12.....	0.60	"	0.30	"	0.30	"	2.15	6.80
13.....	0.60	"	0.30	"	0.60	"	2.05	6.00
14.....	0.70	"	0.30	"	1.20	0.60	2.00	5.50
15.....	0.70	"	0.30	"	1.80	2.60	1.90	5.00
16.....	0.70	"	0.30	"	1.80	2.60	1.90	5.20
17.....	0.70	"	0.30	"	1.70	2.00	1.85	4.50
18.....	0.70	"	0.30	"	1.60	1.60	1.85	4.60
19.....	0.70	"	0.30	"	1.60	1.60	1.85	4.70
20.....	0.65	"	0.30	"	1.55	1.20	1.85	4.80
21.....	0.65	"	0.30	"	1.55	1.20	1.80	4.50
22.....	0.65	"	0.30	"	1.55	1.20	1.80	4.50
23.....	0.65	"	0.30	"	1.50	1.00	1.80	4.50
24.....	0.65	"	0.30	"	1.50	1.00	1.80	4.50
25.....	0.65	"	0.30	"	1.45	0.64	1.80	4.50
26.....	0.65	"	0.30	"	1.40	0.60	1.80	4.60
27.....	0.65	"	0.30	"	1.45	0.65	1.80	4.60
28.....	0.65	"	0.30	"	1.50	1.00	1.80	4.60
29.....	0.30	"	0.30	"	1.50	1.10	1.80	4.60
30.....	0.30	"	0.30	"	1.50	1.10	1.80	4.60
31.....	0.30	"	0.30	"	.....	.....	1.80 ^a	4.60

^a Shifting conditions July 1 to October 31.

MONTHLY DISCHARGE of Bear Creek at Unsworth's Ranch, for 1914.

(Drainage area 100 square miles).

Month.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (12-31).....	159.0	11.00	36.20	0.362	0.270	1,434
April.....	101.0	11.40	34.00	0.338	0.380	2,010
May.....	16.5	5.40	10.00	0.100	0.120	615
June.....	6.6	2.30	4.20	0.042	0.050	248
July.....	2.0	.....	0.22	0.002	0.002	14
August.....	.....	.....	.....	.....	.....	Nil.
September.....	2.6	.....	0.72	0.007	0.008	43
October.....	38.0	1.10	6.90	0.069	0.080	425
The period.....	.....	.....	.....	.....	0.910	4,789

MONTHLY DISCHARGE of Bear Creek near Unsworth's Ranch, for 1913.

(Drainage area 100 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	314.00	15.50	126.00	1.260	1.400	7,468
May.....	22.00	7.40	13.70	0.137	0.158	842
June.....	9.10	2.70	5.40	0.054	0.062	322
July.....	12.40	0.54	4.00	0.040	0.046	244
August.....	1.63	0.10	0.99	0.010	0.011	61
September.....	1.60	0.10	0.52	0.005	0.006	30
October.....	4.40	1.85	3.40	0.034	0.039	210
The period.....					1.722	9,177

NOTE.—This table is inserted in this report to correct a table which was published on page 343 of the report for 1913, the total run-off in acre-feet for April and the period being incorrect as then published.

SESSIONAL PAPER No. 25c

BRANIFF DITCH FROM BEAR CREEK.

Location.—On the SE. $\frac{1}{4}$ Sec. 30, Tp. 11, Rge. 23, W. 3rd Mer.

Records available.—One discharge measurement in 1914.

Gauge.—Vertical staff, at headgate; elevation of zero, 95.91 feet.

Bench-mark.—Stump on right bank; assumed elevation, 100.00 feet.

Discharge measurements.—Made by wading.

Observer.—No observations in 1914.

DISCHARGE MEASUREMENTS of Braniff Ditch from Piapot Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. feet.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
June 12.....	F. R. Steinberger	4 0	6.10	0 81	1 42	4 9

PIAPOT CREEK AT CUMBERLAND'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 18, Tp. 11, Rge. 24, W. 3rd Mer.

Records available.—May 13, 1909, to October 31, 1914; from July 4, 1908, to May 12, 1909, records on this creek were obtained at a station three-quarters of a mile upstream from the present gauge.

Gauge.—Vertical staff; the zero of the gauge was maintained at 89.75 feet during 1909-11, and at 88.75 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Discharge measurements.—Made with weir at low stages, and with meter at ordinary stages.

Winter flow.—This station is not maintained during the winter.

Artificial control.—A log buried in the bed of the stream, about 40 feet below the gauge, forms a control at this station.

Diversions.—Messrs. Fearon and Moorhead, D. Beveridge, Geo. Tranter and A. Cumberland divert water for irrigation purposes above this station.

Observer.—A. Cumberland.

DISCHARGE MEASUREMENTS of Piapot Creek at Cumberland's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. feet.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
March 12.	M. H. French	7 5	2 25	2 09	4 28	4 50 $\frac{1}{2}$
March 17.	H. O. Brown	12 8	6.11	1 56	3 56	9 50 $\frac{1}{2}$
March 31.	do	8 9	12 00	0 62	3 55	7 50 $\frac{1}{2}$
April 3.....	do	7 9	10 70	0 81	3 44	8 70 $\frac{1}{2}$
April 9....	do	10 5	8 53	0 79	1 54	6 80
April 13....	do	12 7	16 00	1 17	2 08	18 80
May 15.....	F. R. Steinberger				1 13	1 66 $\frac{1}{2}$
June 10.....	do				1 04	0 15 $\frac{1}{2}$
July 4....	do				0 97	0 12 $\frac{1}{2}$
July 27....	do					Nil.
Sept. 26.....	E. W. W. Hughes				1 09	0 23 $\frac{1}{2}$

^a Ice conditions.

^b Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Piapot Creek at Cumberland's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.70	11.6	1.31	3.30	0.87	Nil.
2.....			3.46	8.0	1.26	2.70	0.87	"
3.....			3.36 ^a	7.2	1.26	2.70	1.02	0.49
4.....			3.21	6.0	1.19	1.95	0.98	0.21
5.....			3.10	7.5	1.23	2.40	1.05	0.70
6.....			2.10	6.6	1.23	2.40	1.03	0.56
7.....			1.51	6.2	1.19	1.95	1.05	0.70
8.....			1.40	4.6	1.16	1.65	0.93	Nil.
9.....			1.66	9.0	1.14	1.46	0.89	"
10.....			1.44	5.2	1.14	1.46	1.04	0.63
11.....			1.49	5.9	1.14	1.46	1.07 ^b	0.85
12.....	4.28 ^a	4.5	1.51	6.3	1.13	1.37	1.10	1.10
13.....	4.48	12.0	1.43	5.0	1.11	1.19	1.15	1.55
14.....	4.28	12.6	1.69	9.6	1.12	1.28	1.22	2.30
15.....	4.12	13.8	1.74	10.7	1.16	1.65	1.12	1.28
16.....	4.53	29.0	1.63	8.4	1.15	1.55	1.10	1.10
17.....	3.94	18.4	1.53	6.6	1.17 ^b	1.75	1.05	0.70
18.....	4.18	25.0	1.49	5.9	1.18	1.85	1.03	0.56
19.....	3.58	9.6	1.48	5.8	1.17	1.75	0.99	0.28
20.....	3.58	9.5	1.56	7.1	1.16	1.65	0.97	0.14
21.....	3.58	9.4	1.46	5.5	1.15	1.55	0.93	Nil.
22.....	3.58	9.3	1.53	6.6	1.14	1.46	1.05	0.70
23.....	3.71	12.1	1.39	4.4	1.15	1.55	0.99	0.28
24.....	3.57	8.9	1.39	4.4	1.14	1.46	0.88	Nil.
25.....	3.57	8.8	1.37	4.1	1.13	1.37	0.90	Nil.
26.....	3.57	8.7	1.46	5.5	1.10	1.10	0.98	0.21
27.....	3.57	8.6	1.36	4.0	1.05	0.70	0.92	Nil.
28.....	3.67	10.2	1.34	3.7	1.05	0.70	0.90	"
29.....	3.72	11.2	1.32	3.5	0.98	0.21	0.98	0.21
30.....	4.07	19.7	1.30	3.2	0.98	0.21	1.07	0.56
31.....	3.73	11.0			0.87	Nil.		

^a to ^b Ice conditions—discharges estimated.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Piapot Creek at Cumberland's Ranch, for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.04	0.63	Dry.	Nil.	0.96	0.07	0.90	Nil.
2.....	0.95	Nil.	"	"	0.95	Nil.	1.00c	0.35
3.....	0.89	"	"	"	0.90	"	1.10c	1.10
4.....	1.00	0.35	"	"	0.85	"	1.15c	1.55
5.....	0.99	0.28	"	"	0.76	"	1.20c	2.00
6.....	1.05	0.70	"	"	0.78c	"	1.30c	3.20
7.....	0.97	0.14	"	"	0.80	"	1.45	5.30
8.....	0.90	Nil.	"	"	0.90c	"	1.55	7.00
9.....	0.87	"	"	"	0.99	0.28	1.70	9.80
10.....	0.84	"	"	"	0.85	Nil.	1.59	7.60
11.....	0.80	"	"	"	0.81	"	1.56	7.10
12.....	0.74	"	"	"	1.20	2.00	1.44	5.20
13.....	0.74	"	"	"	1.59	7.60	1.36	4.00
14.....	0.97	0.14	"	"	1.25	2.60	1.33	3.60
15.....	0.83	Nil.	"	"	1.15	1.55	1.30	3.20
16.....	0.70	"	"	"	1.11	1.19	1.27	2.80
17.....	0.70	"	"	"	1.06	0.78	1.25	2.60
18.....	0.70	"	"	"	1.05	0.70	1.20	2.00
19.....	Dry.	"	"	"	1.04	0.63	1.18	1.85
20.....	"	"	"	"	1.04	0.63	1.14	1.46
21.....	"	"	"	"	1.03	0.56	1.14	1.46
22.....	"	"	"	"	1.04	0.63	1.15	1.55
23.....	"	"	"	"	1.02	0.49	1.15	1.55
24.....	"	"	0.95	Nil.	1.03	0.56	1.14	1.46
25.....	"	"	1.05	0.70	1.01	0.42	1.14	1.46
26.....	"	"	1.00	0.35	0.99	0.28	1.15	1.55
27.....	"	"	0.94	Nil.	1.03	0.56	1.14	1.46
28.....	"	"	0.75	"	1.02	0.49	1.14	1.46
29.....	"	"	0.74	"	0.90	Nil.	1.14	1.46
30.....	"	"	0.86c	"	0.90	"	1.11	1.46
31.....	"	"	1.09	0.35	"	"	1.14	1.46

c Gauge height interpolated.

MONTHLY DISCHARGE of Piapot Creek at Cumberland's Ranch, for 1914.

(Drainage area 55 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (12-31).....	29.00	4.50	12.60	0.229	0.170	500
April.....	11.60	3.20	6.30	0.114	0.130	373
May.....	3.30	"	1.54	0.028	0.030	95
June.....	2.30	"	0.51	0.009	0.010	31
July.....	0.70	"	0.07	0.001	0.001	4
August.....	0.70	"	0.04	0.001	0.001	3
September.....	7.60	"	0.73	0.013	0.010	44
October.....	9.80	"	2.80	0.014	0.060	175
The period.....					0.412	1,225

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Crane Lake drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Dis-charge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Mar. 31.....	H. O. Brown.....	Bear Creek.....	30-11-23-3.....	8.5	8.34	1.64	13.70
Mar. 31.....	do.....	do.....	do.....	8.3	9.31	1.88	17.50
April 1.....	do.....	do.....	do.....	8.4	12.70	2.04	26.00
April 12.....	do.....	do.....	do.....	21.3	41.20	2.50	103.00
July 28.....	F. R. Steinberger.....	Spring Creek.....	S.E. 8-11-23-3.....				0.14

HAY LAKE DRAINAGE BASIN.

General Description.

Hay Lake is in Township 11, Range 25, West of the 3rd Meridian, and is fed by Hay Creek, which rises in the Cypress Hills. It is a comparatively small body of saline water of an approximate area of three square miles. Like all lakes in this locality it has no outlet.

The basin supplies water for a number of irrigation schemes, and also to the town of Maple Creek for domestic and industrial purposes, the water being piped some nine miles by means of a gravity system.

The annual precipitation averages about 12 inches; during 1913 and 1914 it was slightly less than this amount.

HAY CREEK AT HAY CREEK SCHOOL.

Location.—On the SW. $\frac{1}{4}$ Sec. 29, Tp. 10, Rge. 25, W. 3rd Mer.

Records available.—March 24, 1911, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 94.79 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Slightly shifting.

Discharge measurements.—Made with weir at ordinary stages, and with a meter in high water periods.

Winter flow.—This station is not maintained during the winter.

Diversions.—The town of Maple Creek takes its water from springs at the head of this creek.

Observer.—Miss K. Jones.

DISCHARGE MEASUREMENTS of Hay Creek at Hay Creek School, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 13.....	F. R. Steinberger.....				1.15	0.19 ^a
June 4.....	do.....					Nil.
July 25.....	do.....					"
Aug. 15.....	do.....					"
Sept. 3.....	E. W. W. Hughes.....					"
Sept. 23.....	do.....					"
Nov. 9.....	do.....				1.09	0.02 ^a

^a Weir measurement.

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DAILY GAUGE HEIGHT AND DISCHARGE of Hay Creek at Hay Creek School, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.75	8.00	1.44	2.40	1.21	0.45
2.....			1.59	4.80	1.45	2.50	1.20	0.40
3.....			1.61	5.20	1.45	2.50	1.19	0.35
4.....			1.65	6.00	1.46	2.60	1.16	0.20
5.....			1.65	6.00	1.48	3.00	1.13	0.11
6.....			1.65	6.00	1.49	3.10	1.10	0.05
7.....			1.66	6.20	1.50	3.20	1.08	0.03
8.....			1.63	5.60	1.51	3.40	1.06	0.01
9.....			1.59	4.80	1.52	3.60	1.06	0.01
10.....			1.55	4.00	1.51	3.40	1.06	0.01
11.....			1.51	3.40	1.53	3.70	1.06	0.01
12.....			1.47	2.80	1.50	3.20	1.07	0.02
13.....			1.45	2.50	1.30	0.95	1.08	0.03
14.....			1.41	2.00	1.30	0.95	1.08	0.03
15.....			1.38	1.70	1.30	0.95	1.08	0.03
16.....			1.36	1.50	1.30	0.95	1.08	0.03
17.....			1.34	1.31	1.30	0.95	1.08	0.03
18.....			1.27	0.77	1.31	1.04	1.09	0.04
19.....			1.33	1.22	1.30	0.95	1.08	0.03
20.....	1.67	6.4	1.31	1.04	1.30	0.95	1.09	0.04
21.....	1.66	6.2	1.29	0.89	1.29	0.89	1.09	0.04
22.....	1.51	3.4	1.23	0.55	1.29	0.89	1.09	0.04
23.....	1.50	3.2	1.26	0.71	1.28	0.83	1.09	0.04
24.....	1.49	3.1	1.43	2.30	1.28	0.83	1.09	0.04
25.....	1.49	3.1	1.42	2.10	1.26	0.71	1.08	0.03
26.....	1.49	3.1	1.44	2.40	1.24	0.60	1.08	0.03
27.....	1.47	2.8	1.45	2.50	1.23	0.55	1.09	0.04
28.....	1.46	2.6	1.45	2.50	1.22	0.50	1.09	0.04
29.....	1.45	2.5	1.46	2.60	1.22	0.50	1.09	0.04
30.....	1.46	2.6	1.45	2.50	1.21	0.45	1.08	0.03
31.....	1.49	3.1			1.21	0.45		

DAILY GAUGE HEIGHT AND DISCHARGE of Hay Creek at Hay Creek School, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	1.08	0.03	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.	1.07	0.02	"	"	"	"	"	"
3.	1.07	0.02	"	"	"	"	"	"
4.	1.06	0.01	"	"	"	"	"	"
5.	1.06	0.01	"	"	"	"	"	"
6.	1.06	0.01	"	"	"	"	"	"
7.	1.05	Nil.	"	"	"	"	"	"
8.	1.05	"	"	"	"	"	2.00	13.2
9.	1.04	"	"	"	"	"	2.01	13.4
10.	1.03	"	"	"	"	"	2.02	13.6
11.	1.02	"	"	"	"	"	2.03	13.8
12.	1.02	"	"	"	"	"	2.03	13.8
13.	1.02	"	"	"	"	"	1.02	Nil.
14.	1.02	"	"	"	"	"	1.00	"
15.	1.02	"	"	"	"	"	Dry.	"
16.	1.01	"	"	"	"	"	"	"
17.	1.01	"	"	"	"	"	"	"
18.	1.01	"	"	"	"	"	"	"
19.	1.01	"	"	"	"	"	"	"
20.	1.00	"	"	"	"	"	"	"
21.	0.99	"	"	"	"	"	"	"
22.	0.98	"	"	"	"	"	"	"
23.	Dry.	"	"	"	"	"	"	"
24.	"	"	"	"	"	"	"	"
25.	"	"	"	"	"	"	"	"
26.	"	"	"	"	"	"	"	"
27.	"	"	"	"	"	"	"	"
28.	"	"	"	"	"	"	"	"
29.	"	"	"	"	"	"	"	"
30.	"	"	"	"	"	"	"	"
31.	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Hay Creek at Hay Creek School, for 1914.

(Drainage area 22 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (20-31)	6.40	2.50	3.200	0.1480	0.0070	77
April	8.00	0.55	3.100	0.1420	0.1600	186
May	3.70	0.45	1.660	0.0750	0.0900	102
June	0.45	0.01	0.080	0.0030	0.0030	4
July	0.03	"	0.003	0.0001	0.0001	Nil.
August	"	"	"	"	"	"
September	"	"	"	"	"	"
October	13.80	"	2.200	0.0990	0.1100	134
The period.	"	"	"	"	0.3701	499

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HAY CREEK AT FAUQUIER'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 30, Tp. 10, Rge. 25, W. 3rd Mer.

Records available.—April 25, 1909, to October 31, 1914.

Gauge.—Vertical staff; the elevation of the zero of the gauge has been maintained at 91.39 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Slightly shifting.

Discharge measurements.—Made with meter by wading, and with a weir at low stages.

Winter flow.—This station is not maintained during winter.

Reservoirs.—The town of Maple Creek takes water from the springs at the head of this creek, and Mr. H. Fauquier diverts water for irrigation purposes above the gauge.

Observer.—Miss M. Fauquier.

DISCHARGE MEASUREMENTS of Hay Creek at Fauquier's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 14.	M. H. French.	11.3	11.1	0.93	1.29	10.30
April 3.	H. O. Brown.	5.5	2.7	1.27	0.91	3.40
April 8.	do	5.1	1.9	0.77	0.79	1.49
May 13.	F. R. Steinberger.					Nil.
July 2.	do					"
July 25.	do					"
Aug. 14.	do					"
Sept. 3.	E. W. W. Hughes.					"
Sept. 23.	do					"
Nov. 9.	do					"

DAILY GAUGE HEIGHT AND DISCHARGE of Hay Creek at Fauquier's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.			1.51	14.70	0.53	0.03	Dry.	Nil.
2.			1.03	5.50	0.21	Nil.	"	"
3.			0.77	1.24	Dry.	"	"	"
4.			0.89	3.00	"	"	"	"
5.			1.27	9.90	"	"	"	"
6.			1.01	5.20	"	"	"	"
7.			0.93	3.70	"	"	"	"
8.			0.56	0.06	"	"	"	"
9.			0.71	0.68	"	"	"	"
10.			0.89	3.00	"	"	"	"
11.			0.61	0.13	"	"	"	"
12.	1.16	7.90	1.03	5.50	"	"	"	"
13.	1.33	11.10	1.26	9.70	"	"	"	"
14.	1.37	11.90	1.16	7.90	"	"	"	"
15.	1.03	5.50	1.21	8.80	"	"	"	"
16.	0.81	1.76	1.14	7.50	"	"	"	"
17.	0.97	4.50	0.93	3.70	"	"	"	"
18.	0.81	1.76	0.87	2.70	"	"	"	"
19.			0.82	1.92	"	"	"	"
20.			0.81	1.76	"	"	"	"
21.			0.75	1.00	"	"	"	"
22.			0.67	0.39	"	"	"	"
23.			0.66	0.32	"	"	"	"
24.			0.67	0.39	"	"	"	"
25.			0.63	0.19	"	"	"	"
26.			0.68	0.46	"	"	"	"
27.			0.65	0.25	"	"	"	"
28.			0.60	0.10	"	"	"	"
29.			0.61	0.13	"	"	"	"
30.	0.75	1.00	0.59	0.09	"	"	"	"
31.	1.21	8.80			"	"	"	"

a to a Channel frozen.

DAILY GAUGE HEIGHT AND DISCHARGE of Hay Creek at Fauquier's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	"	"
5.....	"	"	"	"	"	"	"	"
6.....	"	"	"	"	"	"	"	"
7.....	"	"	"	"	"	"	"	"
8.....	"	"	"	"	"	"	1.71	18.7
9.....	"	"	"	"	"	"	1.73	19.3
10.....	"	"	"	"	"	"	1.04	5.7
11.....	"	"	"	"	"	"	1.40	12.5
12.....	"	"	"	"	"	"	0.50	Nil.
13.....	"	"	"	"	"	"	Dry.	"
14.....	"	"	"	"	"	"	"	"
15.....	"	"	"	"	"	"	"	"
16.....	"	"	"	"	"	"	"	"
17.....	"	"	"	"	"	"	"	"
18.....	"	"	"	"	"	"	"	"
19.....	"	"	"	"	"	"	"	"
20.....	"	"	"	"	"	"	"	"
21.....	"	"	"	"	"	"	"	"
22.....	"	"	"	"	"	"	"	"
23.....	"	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Hay Creek at Fauquier's Ranch, for 1914.

(Drainage area 24 square miles.)

MONTH.	DISCHARGE IN SECOND-FOOT.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (12-31).....	11.90		2.70	0.113	0.08	108
April.....	14.70	0.06	3.30	0.139	0.16	198
May.....	0.03					Nil.
June.....						"
July.....						"
August.....						"
September.....						"
October.....	19.3		1.81	0.075	0.09	111
The period.....					0.33	417

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MISCELLANEOUS DISCHARGE MEASUREMENTS made in Hay Lake drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Dis-charge. Sec. ft.
Jan. 19	F. R. Steinberger	Saunder's Springs	S.E. 20-10-25-3	0.15
Feb. 7	do	do	do	0.56
Feb. 26	do	do	do	0.35
Mar. 17	do	do	do	0.52
April 17	H. O. Brown	do	do	0.78
May 13	F. R. Steinberger	do	do	1.01
June 6	do	do	do	1.06
July 2	do	do	do	0.82
July 25	do	do	do	0.60
Aug. 15	do	do	do	0.43
Sept. 3	E. W. Hughes	do	do	0.38
Sept. 23	do	do	do	0.40
Nov. 9	do	do	do	0.55
Dec. 3	J. E. Caughey	do	do	0.72
Dec. 18	do	do	do	0.56
Jan. 19	F. R. Steinberger	Upper Spring	S.E. 10-10-25-3	0.16
Feb. 7	do	do	do	0.16
Feb. 26	do	do	do	0.20
Mar. 17	do	do	do	0.21
April 8	H. O. Brown	do	do	0.20
May 13	F. R. Steinberger	do	do	0.37
June 6	do	do	do	0.17
July 2	do	do	do	0.17
July 25	do	do	do	0.16
Aug. 15	do	do	do	0.18
Sept. 3	E. W. Hughes	do	do	0.20
Sept. 23	do	do	do	0.19
Nov. 9	do	do	do	0.17
Dec. 3	J. E. Caughey	do	do	0.16
Dec. 18	do	do	do	0.15
April 8	H. O. Brown	Hay Creek	S.E. 10-10-25-3	0.45
April 8	do	do	N.W. 9-10-25-3	0.60

BIG STICK LAKE DRAINAGE BASIN.

General Description.

Big Stick is one of the largest lakes in the northern Cypress Hills district. It is situated about Township 15, Range 25, West of the 3rd Meridian, and covers an area of 35 square miles. The lake is alkaline in character and has no outlet.

The only source of supply of the lake is Maple Creek, which with its tributary, Gap Creek, rises in the Cypress Hills 30 miles south. On the south and east the lake is bounded by the sandhills. The drainage area is 820 square miles.

The topography of the drainage basin is for the most part gently rolling, and the creek slope is small except near the source. The basin is bare of trees except in the hills. The channel is flat, wide, and in most places sandy.

There are several small irrigation ditches in the basin.

ADAMS' NORTH DITCH NEAR MAPLE CREEK.

Location.—On the NE. $\frac{1}{4}$ Sec. 10, Tp. 9, Rge. 27, W. 3rd Mer., at Geo. A. Adams' ranch.

Records available.—May 22 to October 31, 1914.

Gauge.—Vertical staff, located near the left bank and 50 feet below the headgate; elevation of zero, 97.14 feet.

Bench-mark.—Top of wooden stake about eight feet from gauge on the left bank; assumed elevation, 100.00 feet.

Control.—A permanent 24-inch sharp-crested weir, with complete end contractions, acts as a control. The crest of the weir is maintained at an elevation of 99.09 feet.

Channel.—Composed of a black, sandy loam.

Discharge measurements.—Computed from the measured head over the weir.

Observer.—Geo. A. Adams.

Remarks.—This ditch was used for three days during 1914, May 24-26, with an estimated total discharge of one acre-foot.

ADAMS' SOUTH DITCH NEAR MAPLE CREEK.

Location.—On the NE. $\frac{1}{4}$ Sec. 10, Tp. 9, Rge. 27, W. 3rd Mer., at Geo. A. Adams' ranch.

Records available.—May 22 to October 31, 1914.

Gauge.—Vertical staff, located near the left bank about 100 feet below the headgate; elevation of zero, 97.64 feet.

Bench-mark.—The top of a wooden stake across the ditch from the gauge rod; assumed elevation, 100.00 feet.

Control.—A permanent 24-inch sharp-crested weir, with complete end contractions, is used as a control; the elevation of the crest is maintained at 99.32 feet.

Channel.—Composed of sandy loam.

Discharge measurements.—Computed from the measured head over the weir.

Observer.—Geo. A. Adams.

Remarks.—The ditch was used for eight days, June 7-14, during 1914, with a total estimated discharge of four acre-feet.

GAP CREEK AT SMALL'S RANCH.

Location.—On the SE. $\frac{1}{4}$ Sec. 4, Tp. 10, Rge. 27, W. 3rd Mer., at Wm. Small's ranch.

Records available.—April 24, 1909, to October 31, 1914.

Gauge.—Vertical staff; the zero of the gauge was maintained at 66.53 feet during 1909-10; 66.62 feet during 1911; 66.63 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of loose stones and gravel, and liable to shift during flood stages.

Discharge measurements.—Made from cable car during high stages; by wading or with a weir during low stages.

Winter flow.—Station discontinued during winter season.

Observer.—Wm. Small.

DISCHARGE MEASUREMENTS of Gap Creek at Small's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 14.....	H. D. St. A. Smith.....	55.0	72.0	2.02	3.74	146.00
Mar. 17.....	H. R. Carscallen.....	33.0	33.9	0.63	2.46	21.00
April 16.....	H. O. Brown.....	40.0	58.2	1.68	3.00	98.00
May 6.....	H. W. Rowley.....	17.0	9.8	0.81	2.25	8.00
June 8.....	do.....				1.84	Nil.
June 23.....	do.....				1.43	"
July 17.....	do.....				Dry.	"
July 24.....	do.....				"	"
Sept. 3.....	do.....				"	"
Sept. 16.....	do.....				2.00	0.78
Oct. 9.....	do.....	43.0	66.0	3.11	3.30	205.00
Nov. 6.....	do.....				1.90	Nil.

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DAILY GAUGE HEIGHT AND DISCHARGE of Gap Creek at Small's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.87	71.0	2.10	2.70	1.84	Nil.
2.....			2.84	65.0	2.10	2.70	1.84	"
3.....			2.72	47.0	2.10	2.70	1.84	"
4.....			2.71	46.0	2.10	2.70	1.84	"
5.....			3.22	168.0	2.16	4.40	1.86	0.02
6.....	3.11	127.0	2.96	88.0	2.26	8.40	1.85	Nil.
7.....	3.06	113.0	2.72	47.0	2.26	8.40	1.84	"
8.....	3.03	105.0	2.47	21.0	2.36	13.60	1.84	"
9.....	2.96	88.0	2.49	23.0	2.38	14.80	1.84	"
10.....	2.66	39.0	2.43	18.0	2.40	16.00	1.84	"
11.....	2.61	34.0	2.42	17.0	2.36	13.60	1.86	0.02
12.....	2.71	46.0	2.94	84.0	2.24	7.50	1.90	0.10
13.....	3.34	227.0	3.08	118.0	2.17	4.80	1.96	0.40
14.....	3.52	344.0	2.99	96.0	2.09	2.50	1.92	0.18
15.....	3.14	137.0	2.94	84.0	2.06	1.82	1.90	0.10
16.....	2.78	56.0	2.92	80.0	2.03	1.28	1.86	0.02
17.....	2.48	22.0	2.75	52.0	2.02	1.12	1.86	0.02
18.....	2.40	16.0	2.50	24.0	2.00	0.80	1.82	Nil.
19.....	2.46	20.0	2.42	17.0	1.98	0.60	1.80	"
20.....	2.34	12.4	2.47	21.0	1.98	0.60	1.60	"
21.....	2.21	6.2	2.40	16.0	1.98	0.60	1.80	"
22.....	2.19	5.5	2.31	10.8	1.97	0.50	1.78	"
23.....	2.11	3.0	2.28	9.3	1.97	0.50	1.78	"
24.....	2.17	4.8	2.29	9.7	1.97	0.50	1.78	"
25.....	2.30	10.2	2.26	8.4	1.96	0.40	1.87	0.04
26.....	2.29	9.7	2.26	8.4	1.94	0.26	1.86	0.02
27.....	2.26	8.4	2.21	6.2	1.93	0.22	1.84	Nil.
28.....	2.19	5.5	2.16	4.4	1.91	0.14	1.82	"
29.....	2.11	3.0	2.13	3.5	1.89	0.08	1.84	"
30.....	2.50	24.0	2.12	3.2	1.88	0.06	1.84	"
31.....	2.50	24.0			1.86	0.02		

DAILY GAUGE HEIGHT AND DISCHARGE of Gap Creek at Small's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.82	Nil.	1.69	Nil.	1.65	Nil.	1.78	Nil.
2.....	1.79	"	1.68	"	1.65	"	1.78	"
3.....	1.79	"	1.68	"	1.65	"	1.78	"
4.....	1.79	"	1.67	"	1.65	"	2.40	16.00
5.....	1.79	"	1.68	"	1.65	"	2.20	5.80
6.....	1.78	"	1.68	"	1.64	"	2.46	20.00
7.....	1.78	"	1.67	"	1.64	"	2.46	20.00
8.....	1.78	"	1.69	"	1.64	"	3.45	290.00
9.....	1.78	"	1.69	"	1.64	"	3.28	196.00
10.....	1.77	"	1.70	"	1.64	"	2.69	43.00
11.....	1.76	"	1.70	"	1.63	"	2.50	24.00
12.....	1.74	"	1.69	"	1.63	Nil.	2.33	11.90
13.....	1.72	"	1.69	"	2.46	20.00	2.22	6.60
14.....	1.70	"	1.68	"	2.50	24.00	2.20	5.80
15.....	1.69	"	1.65	"	2.16	4.40	2.18	5.00
16.....	1.67	"	1.65	"	2.00	0.80	2.15	4.10
17.....	1.65	"	1.65	"	1.93	0.22	2.10	2.70
18.....	1.64	"	1.68	"	1.89	0.08	2.05	1.60
19.....	1.64	"	1.68	"	1.84	Nil.	2.02	1.12
20.....	1.64	"	1.68	"	1.83	"	2.02	1.12
21.....	1.64	"	1.68	"	1.83	"	2.03	1.28
22.....	1.64	"	1.67	"	1.83	"	2.01	0.96
23.....	1.63	"	1.67	"	1.83	"	1.99	0.70
24.....	1.73	"	1.68	"	1.83	"	1.97	0.50
25.....	1.73	"	1.69	"	1.83	"	1.95	0.30
26.....	1.73	"	1.68	"	1.83	"	1.94	0.26
27.....	1.72	"	1.66	"	1.80	"	1.94	0.26
28.....	1.69	"	1.66	"	1.79	"	1.94	0.26
29.....	1.69	"	1.66	"	1.79	"	1.94	0.26
30.....	1.69	"	1.66	"	1.78	"	1.95	0.30
31.....	1.69	"	1.66	"			1.95	0.30

MONTHLY DISCHARGE of Gap Creek at Small's Ranch, for 1914.

(Drainage area 108 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (6-31).....	344.00	3.00	57.00	0.5310	0.5200	2,956
April.....	168.00	3.20	42.00	0.3910	0.4400	2,514
May.....	16.00	0.02	3.70	0.0342	0.0390	227
June.....	0.40	0.00	0.03	0.0003	0.0003	Nil.
July.....						2
August.....						Nil.
September.....	24.00	0.00	1.65	0.0153	0.0200	98
October.....	290.00	0.00	21.00	0.1970	0.2300	1,309
The period.....					1.2500	7,106

SESSIONAL PAPER No. 25c

MC SHANE CREEK AT SMALL'S RANCH.

Location.—On the SW. $\frac{1}{4}$ Sec. 3, Tp. 10, Rge. 27, W. 3rd Mer., at the highway bridge near Wm. Small's house.

Records available.—April 24, 1909, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge was maintained at 86.41 feet during 1909-10; 85.71 feet during 1911-12; 85.21 feet during 1913; 85.74 feet during 1914.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of sand and gravel, and shifts during flood stages.

Discharge measurements.—Made by wading, or from the highway bridge during flood stages.

Winter flow.—Station discontinued during winter season.

Observer.—Wm. Small.

DISCHARGE MEASUREMENTS of McShane Creek at Small's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 14.....	H. D. St. A. Smith.....	10.0	5.40	1.79	1.25	9.70
Mar. 17.....	H. R. Carscallen.....	12.6	6.87	0.54	1.06	3.70
April 16.....	H. O. Brown.....	12.2	6.56	1.54	1.19	10.12
May 6.....	H. W. Rowley.....	7.0	2.98	0.70	0.98	1.69
May 29.....	do.....				Dry.	Nil.
June 8.....	do.....				"	"
June 23.....	do.....				"	"
July 17.....	do.....				"	"
July 24.....	do.....				"	"
Sept. 3.....	do.....				"	"
Sept. 16.....	do.....				"	"
Oct. 9.....	do.....	21.5	30.7	0.65	1.16	20.00
Nov. 6.....	do.....				Dry.	Nil.

DAILY GAUGE HEIGHT AND DISCHARGE of McShane Creek at Small's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.19	10.10	Dry.	Nil.	Dry.	Nil.
2.....			1.11	6.80	"	"	"	"
3.....			0.96	1.42	"	"	"	"
4.....	1.07	2.20	1.10	5.30	"	"	"	"
5.....	1.06	2.00	1.20	10.70	0.89	0.63	"	"
6.....	1.06	2.00	1.16	8.40	0.96	1.42	"	"
7.....	1.05	1.80	0.95	1.25	0.92	0.92	"	"
8.....	1.07	2.20	0.88	0.56	0.99	1.93	"	"
9.....	1.15	4.60	0.91	0.81	1.00	2.10	"	"
10.....	1.15	4.60	0.90	0.70	0.89	0.63	"	"
11.....	1.15	4.60	0.91	0.81	0.83	0.25	"	"
12.....	1.20	6.80	1.13	6.80	0.66	Nil.	"	"
13.....	1.30	12.70	1.18	9.50	Dry.	"	"	"
14.....	1.31	13.40	1.18	9.50	"	"	"	"
15.....	1.26	11.90	1.18	9.50	"	"	"	"
16.....	1.08	3.90	1.18	9.50	"	"	"	"
17.....	0.95	1.25	1.10	5.30	"	"	"	"
18.....	0.98	1.76	1.06	3.80	"	"	"	"
19.....	0.83	0.25	1.00	2.10	"	"	"	"
20.....	0.63	Nil.	1.06	3.80	"	"	"	"
21.....	0.60	"	0.99	1.93	"	"	"	"
22.....	0.35	"	0.92	0.92	"	"	"	"
23.....	"	"	0.99	1.93	"	"	"	"
24.....	0.75	"	0.95	1.25	"	"	"	"
25.....	"	"	0.90	0.70	"	"	"	"
26.....	"	"	0.86	0.42	"	"	"	"
27.....	"	"	0.81	0.15	"	"	"	"
28.....	"	"	0.74	Nil.	"	"	"	"
29.....	"	"	0.77	0.04	"	"	"	"
30.....	1.38	22.00	0.64	Nil.	"	"	"	"
31.....	1.30	16.70			"	"		

DAILY GAUGE HEIGHT AND DISCHARGE of McShane Creek at Small's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	1.17	21.00
5.....	"	"	"	"	"	"	0.97	7.90
6.....	"	"	"	"	"	"	0.97	7.90
7.....	"	"	"	"	"	"	1.14	18.70
8.....	"	"	"	"	"	"	1.92	71.00
9.....	"	"	"	"	"	"	1.27	27.00
10.....	"	"	"	"	"	"	0.77	1.20
11.....	"	"	"	"	"	"	0.62	Nil.
12.....	"	"	"	"	"	"	0.52	"
13.....	"	"	"	"	1.23	31.0	0.51	"
14.....	"	"	"	"	0.86	3.1	0.43	"
15.....	"	"	"	"	Dry.	Nil.	0.61	"
16.....	"	"	"	"	"	"	0.52	"
17.....	"	"	"	"	"	"	0.43	"
18.....	"	"	"	"	"	"	Dry.	"
19.....	"	"	"	"	"	"	"	"
20.....	"	"	"	"	"	"	"	"
21.....	"	"	"	"	"	"	"	"
22.....	"	"	"	"	"	"	"	"
23.....	"	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of McShane Creek at Small's Ranch, for 1914.

(Drainage area 28 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (4-31).....	22.00	0.00	4.10	0.1460	0.15	228
April.....	10.70	0.00	3.77	0.1350	0.15	224
May.....	2.10	0.00	0.25	0.0090	0.01	16
June.....						Nil.
July.....						"
August.....						"
September.....	31.00	0.00	1.14	0.0407	0.04	68
October.....	71.00	0.00	5.00	0.1800	0.21	307
The period.....					0.56	843

MAPLE CREEK AT MAPLE CREEK (UPPER STATION).

Location.—On the NE. $\frac{1}{4}$ Sec. 16, Tp. 11, Rgc. 26, W. 3rd Mer., at the first highway bridge north of the town of Maple Creek.

Records available.—May 13, 1908, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge was maintained at 2,492.64 ft. during 1908-09-10-11-14, and at 2,492.71 feet during the years of 1912 and 1913.

SESSIONAL PAPER No. 25c

Bench-marks.—Permanent iron bench-mark. Elevation, 2,499 875 feet above sea level, which is referred to the Geodetic Survey bench-mark No. 145c, on the northeast corner of the post office at Maple Creek, Sask., the elevation of which is 2,510.39 feet above mean sea level.

Channel.—Composed of sand, and may shift during flood stages.

Discharge measurements.—Made from the bridge, by wading, or with a weir.

Winter flow.—Station discontinued during winter season.

Observer.—Miss Kate Williams.

DISCHARGE MEASUREMENTS of Maple Creek at Maple Creek (Upper Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 13.....	M. H. French.....	8.0	4.90	0.56	1.47	2.70
April 7.....	H. O. Brown.....	33.0	57.50	0.87	2.76	49.00
April 15.....	do.....	31.7	49.00	1.00	2.83	49.00
April 18.....	do.....	27.5	25.50	0.74	2.05	18.90
May 7.....	H. W. Rowley.....	18.0	8.80	0.55	1.45	4.80
May 12.....	do.....	11.0	7.10	0.83	1.51	5.90
May 30.....	do.....				0.56	Nil.
June 10.....	do.....				0.87	"
June 26.....	do.....				Dry.	"
July 18.....	do.....				"	"
Aug. 14.....	do.....				"	"
Sept. 4.....	do.....				"	"
Sept. 17.....	do.....				"	"
Oct. 12.....	do.....	19.00	23.30	0.67	2.00	14.90
Nov. 7.....	do.....				0.77	Nil.

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek at Maple Creek (Upper Station), for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.45	32.0	1.34	3.40	0.84	0.23
2.....			2.55	36.0	1.33	3.30	0.84	0.23
3.....			2.43	31.0	1.31	3.10	0.84	0.23
4.....			2.27	25.0	1.32	3.20	0.80	0.15
5.....			2.60	39.0	1.34	3.40	0.80	0.15
6.....			1.95	14.7	1.60	7.00	0.73	0.03
7.....			2.80	49.0	1.44	4.60	0.69 ^a	Nil.
8.....			2.15	20.0	1.44	4.60	0.65	"
9.....			1.80	11.0	1.48	5.10	0.62	"
10.....			1.77 ^a	10.4	1.68	8.60	0.65	"
11.....			1.75	10.0	1.53	5.90	0.72	0.02
12.....			1.72	9.4	1.48	5.10	0.72	0.02
13.....	1.45	4.70	2.70	44.0	1.40	4.00	0.74	0.04
14.....	2.76	47.00	2.79	48.0	1.35	3.50	0.74	0.04
15.....	3.45	92.00	2.70	44.0	1.28	2.80	0.70	Nil.
16.....	3.10	67.00	2.58	38.0	1.28	2.80	0.62	"
17.....	2.40	30.00	2.36	28.0	1.24	2.40	0.62	"
18.....	1.80	11.00	2.14	20.0	1.21	2.10	0.62	"
19.....	1.65 ^a	8.00	2.03	16.9	1.18	1.84	0.60	"
20.....	1.50	5.40	1.85	12.2	1.13	1.46	0.58	"
21.....	1.69	8.80	1.90	13.5	1.10	1.25	0.58	"
22.....	1.61	7.20	1.79	10.8	1.08	1.13	0.58	"
23.....	1.45	4.70	1.64	7.8	1.02	0.80	0.58	"
24.....	1.23	2.30	1.67	8.4	0.96 ^a	0.58	0.58	"
25.....	1.17	1.76	1.68	8.6	0.90	0.40	0.58	"
26.....	1.19	1.92	1.59	6.8	0.88	0.34	0.58	"
27.....	1.21	2.10	1.56	6.4	0.73	0.03	0.58	"
28.....	1.23	2.30	1.44	4.6	0.82	0.19	0.58	"
29.....	1.25	2.50	1.37	3.7	0.82 ^a	0.19	0.58	"
30.....	1.45	4.70	1.34	3.4	0.82	0.19	Dry.	"
31.....	1.40	4.00			0.84	0.23		

^a Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek at Maple Creek (Upper Station)
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.66	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	0.66	"	"	"	"	"	"	"
3.....	0.64	"	"	"	"	"	"	"
4.....	0.64	"	"	"	"	"	"	"
5.....	0.62	"	"	"	"	"	"	"
6.....	0.62	"	"	"	"	"	"	"
7.....	0.62	"	"	"	"	"	"	"
8.....	Dry.	"	"	"	"	"	2.16	21.00
9.....	"	"	"	"	"	"	3.26	78.00
10.....	"	"	"	"	"	"	3.16	71.00
11.....	"	"	"	"	"	"	2.60 _a	39.00
12.....	"	"	"	"	"	"	1.98	15.50
13.....	"	"	"	"	"	"	1.90 _a	13.50
14.....	"	"	"	"	"	"	1.80	11.00
15.....	"	"	"	"	"	"	1.50	5.40
16.....	"	"	"	"	"	"	1.30	3.00
17.....	"	"	"	"	"	"	1.15	1.60
18.....	"	"	"	"	"	"	1.00	0.70
19.....	"	"	"	"	"	"	0.90 _a	0.40
20.....	"	"	"	"	"	"	0.83	0.21
21.....	"	"	"	"	"	"	0.80 _a	0.15
22.....	"	"	"	"	"	"	0.78	0.11
23.....	"	"	"	"	"	"	0.76 _a	0.07
24.....	"	"	"	"	"	"	0.74	0.04
25.....	"	"	"	"	"	"	0.71 _a	0.01
26.....	"	"	"	"	"	"	0.68	Nil.
27.....	"	"	"	"	"	"	0.66 _a	"
28.....	"	"	"	"	"	"	0.64	"
29.....	"	"	"	"	"	"	0.61 _a	"
30.....	"	"	"	"	"	"	0.58	"
31.....	"	"	"	"	"	"	0.55	"

a Gauge height interpolated.

MONTHLY DISCHARGE of Maple Creek at Maple Creek (Upper Station), for 1914.
(Drainage area 81 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	92.00	1.76	16.20	0.2000	0.1400	610
April.....	40.90	3.40	20.00	0.2520	0.2800	1,214
May.....	8.60	0.03	2.70	0.0330	0.0400	165
June.....	0.23	0.00	0.04	0.0005	0.0006	2
July.....						Nil.
August.....						"
September.....						"
October.....	78.00	0.00	8.40	0.1040	0.1200	517
The period.....					0.5800	2,508

MAPLE CREEK NEAR MAPLE CREEK (LOWER STATION).

Location.—On the SE. $\frac{1}{4}$ Sec. 28, Tp. 11, Rge. 26, W. 3rd Mer.

Records available.—May 4, 1910, to October 31, 1914.

Gauge.—Vertical staff; zero of the gauge was maintained at 81.64 feet during 1910-11; 81.60 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of sand, and liable to shift during flood stage.

Discharge measurements.—Made from the bridge, or by wading, or with a weir.

Winter flow.—Station discontinued during the winter season.

Observer.—Miss Kate Williams.

SESSIONAL PAPER No. 25c

DISCHARGE MEASUREMENTS of Maple Creek near Maple Creek (Lower Station), in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
April 15.....	H. O. Brown..	25.90	28.90	1.23	4.25	35.00
April 18.....	do	25.50	20.50	1.15	3.77	24.00
May 7.....	H. W. Rowley	12.00	5.70	0.78	2.98	4.40
May 12.....	do	12.00	9.05	0.67	3.05	6.10
May 30.....	do				2.52	.....^a
June 10.....	do				2.55	0.18
June 26.....	do	<i>b</i>			2.81	0.32
July 18.....	do	<i>b</i>			2.76	0.09
July 25.....	do	<i>b</i>			2.67	0.07
Aug. 14.....	do	<i>b</i>			2.54	0.04
Sept. 4.....	do	<i>b</i>			2.55	0.34
Sept. 17.....	do	<i>b</i>			5.66	93.40
Oct. 10.....	do	36.00	29.80	1.17	3.76	15.90
Oct. 12.....	do	14.50	17.40	0.92	2.38	0.40
Nov. 7.....	do	<i>b</i>				

^a Slight flow, too small to measure.^b Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek near Maple Creek (Lower Station), for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.87	23.0	2.98	4.70	2.32	0.20 ^c
2.....			3.90	24.0	2.95	4.30	2.30	0.20
3.....			3.87	23.0	2.83	2.90	2.30	0.20
4.....			3.85	23.0	2.88 ^a	3.50	2.54	0.18
5.....			4.02	28.0	2.93	4.10	2.54	0.18
6.....			4.65	50.0	3.15	7.30	2.54	0.18
7.....			4.42	41.0	2.98	4.70	2.54	0.18
8.....			3.82	22.0	3.00	5.00	2.55	0.18
9.....			3.35	11.0	3.15	7.30	2.56	0.18
10.....			3.34 ^a	10.8	3.09	6.30	2.61	0.18
11.....			3.33	10.6	3.02	5.30	2.62	0.18
12.....			3.31	10.2	2.90	3.70	2.61	0.18
13.....	6.38	129.0	4.48	43.0	2.86	3.30	2.61	0.18
14.....	6.70	145.0	4.78	55.0	2.70	1.70	2.61	0.18
15.....	6.70	145.0	4.48	43.0	2.70	1.70	2.62	0.18
16.....	6.34	127.0	4.11	30.0	2.68 ^a	1.57	2.62	0.19
17.....	4.19	33.0	4.05	29.0	2.65	1.37	2.60	0.20
18.....	3.50	14.2	3.81	22.0	2.71	1.79	2.60	0.20
19.....	3.60 ^a	16.5	3.67	18.2	2.68	1.57	2.60 ^a	0.20
20.....	3.70	18.9	3.53	14.9	2.62	1.18	2.60	0.20
21.....	3.67	18.2	3.53	14.9	2.54	0.81	2.56	0.21
22.....	3.02	5.3	3.30	11.8	2.50	0.65	2.56	0.22
23.....	3.02	5.3	3.20	8.0	2.40	0.40	2.56	0.23
24.....	2.98	4.7	3.18	7.7	2.47 ^a	0.58	2.50	0.23
25.....	2.97	4.6	3.19	7.9	2.54	0.81	2.50	0.23
26.....	2.98 ^a	4.7	3.15	7.3	2.58	0.97	2.50	0.23
27.....	2.99 ^a	4.9	3.12	6.8	2.58	0.97	2.40	0.22
28.....	3.00 ^a	5.0	3.07	6.0	2.56	0.89	2.40	0.22
29.....	3.01	5.2	2.99	4.9	2.46	0.55	2.38	0.20
30.....	3.54	15.1	2.98	4.7	2.36	0.32	2.30	0.20
31.....	3.87	23.2			2.32	0.24		

^a Gauge height interpolated.^c Shifting conditions June 1 to Sept. 15.

DAILY GAUGE HEIGHT AND DISCHARGE of Maple Creek near Maple Creek (Lower Station).
for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.30 ^a	0.20	2.22	0.11	2.40	0.40	2.52	0.73
2.....	2.30	0.20	2.30	0.20	2.20	0.05	2.52	0.73
3.....	2.30	0.20	2.30	0.20	2.20	0.05	2.96 ^b	4.90
4.....	2.30	0.20	2.40	0.40	2.40	0.40	3.46 ^b	13.30
5.....	2.40	0.20	2.45	0.52	2.40	0.40	3.93 ^b	25.00
6.....	2.40	0.20	2.50	0.65	2.41	0.42	4.40 ^b	40.00
7.....	2.40	0.20	2.55 ^b	0.85	2.42	0.45	4.87 ^b	59.00
8.....	2.50	0.21	2.60	1.05	2.44	0.50	5.34 ^b	79.00
9.....	2.50	0.21	2.60	1.05	2.40	0.40	5.82	101.00
10.....	2.60	0.22	2.70	1.70	2.53	0.78	5.70	95.00
11.....	2.70	0.23	2.70	1.70	2.53	0.78	4.10	30.00
12.....	2.80	0.24	2.77	2.30	2.60 ^b	1.05	3.80	22.00
13.....	2.90	0.26	2.77	2.30	2.65 ^b	1.37	3.00	5.00
14.....	2.90	0.28	2.67	1.46	2.72 ^b	1.88	2.90 ^b	3.70
15.....	2.90	0.30	2.70	1.70	2.78	2.40 ^c	2.80	2.60
16.....	2.90	0.33	2.70	1.70	2.76	2.20	2.80 ^b	2.60
17.....	2.90	0.35	2.68 ^b	1.57	2.61	1.12	2.80	2.60
18.....	2.81	0.32	2.66	1.44	2.60	1.05	2.80 ^b	2.60
19.....	2.81	0.32	2.66 ^b	1.44	2.57	0.93	2.80	2.60
20.....	2.80	0.31	2.66	1.44	2.57	0.93	2.70 ^b	1.70
21.....	2.79	0.30	2.70	1.70	2.55	0.85	2.60	1.05
22.....	2.78	0.23	2.70	1.70	2.54 ^b	0.81	2.60 ^b	1.05
23.....	2.78	0.20	2.70	1.70	2.53	0.77	2.60	1.05
24.....	2.77	0.15	2.64	1.31	2.53 ^b	0.77	2.59 ^b	1.01
25.....	2.76	0.10	2.68	1.57	2.53	0.77	2.58	0.97
26.....	2.76	0.10	2.68	1.57	2.52	0.73	2.58 ^b	0.97
27.....	2.74	0.09	2.65	1.37	2.53	0.77	2.58	0.97
28.....	2.60	0.08	2.65	1.37	2.53	0.77	2.58	0.97
29.....	2.50	0.08	2.60	1.05	2.52 ^b	0.73	2.58	0.97
30.....	2.40	0.09	2.55	0.85	2.50	0.65	2.58 ^b	0.97
31.....	2.40	0.10	2.50	0.65	.....	.....	2.59	1.01

^a Gauge heights unreliable Aug. 1 to 31; correction applied.^b Gauge height interpolated.^c Shifting conditions June 1 to Sept. 15.MONTHLY DISCHARGE of Maple Creek near Maple Creek (Lower Station), for 1914.
(Drainage area 86 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	145.00	4.60	38.10	0.4430	0.310	1,437
April.....	55.00	4.70	20.40	0.2370	0.260	1,214
May.....	7.30	0.24	2.60	0.0302	0.035	160
June.....	0.23	0.18	0.20	0.0023	0.003	12
July.....	0.35	0.08	0.21	0.0024	0.003	13
August.....	2.30	0.11	1.25	0.0145	0.017	77
September.....	2.40	0.05	0.84	0.0098	0.010	50
October.....	101.00	0.73	16.30	0.1900	0.220	1,002
The period.....	.....	.....	.....	.....	0.860	3,965

GAP CREEK NEAR MAPLE CREEK.

Location.—On the road allowance east of the NE. $\frac{1}{4}$ Sec. 31, Tp. 11, Rge. 26, W. 3rd Mer., at the highway traffic bridge.*Records available.*—May 4, 1910, to October 31, 1914.*Gauge.*—Vertical staff; the zero of the gauge was maintained at 81.44 feet during 1910-11; 81.61 feet during 1912-14.

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Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of sand, and shifting.

Discharge measurements.—Made from bridge, by wading, or with a weir.

Winter flow.—Station discontinued during winter season.

Observer.—Miss Kate Williams.

DISCHARGE MEASUREMENTS of Gap Creek near Maple Creek, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 14.....	M. H. French.....	47.0	104.0	1.76	3.69	183.00
April 7.....	H. O. Brown.....	47.6	88.8	1.36	2.97	121.00
April 15.....	do.....	24.0	58.1	1.59	3.07	93.00
April 18.....	do.....	35.8	34.3	1.37	2.30	47.00
May 7.....	H. W. Rowley.....	10.0	6.4	1.36	1.47	8.70
May 12.....	do.....	11.0	9.2	1.82	1.72	16.70
May 30.....	do.....	<i>a</i>			0.97	0.05
June 10.....	do.....				Dry.	Nil.
June 26.....	do.....				"	"
July 18.....	do.....				"	"
July 25.....	do.....				"	"
Aug. 14.....	do.....				"	"
Sept. 4.....	do.....				"	"
Sept. 17.....	do.....	<i>a</i>			1.32	2.20
Oct. 12.....	do.....	22.0	21.1	1.30	2.08	28.00
Oct. 14.....	do.....	11.0	8.4	1.41	1.64	11.80
Nov. 7.....	do.....				0.99	Nil.

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Gap Creek near Maple Creek, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.32	139.0	1.30	5.10	0.95	Nil.
2.....			2.72	79.0	1.31	5.30	0.95	"
3.....			2.81	87.0	1.31	5.30	0.95	"
4.....			2.35	50.0	1.30 ^a	5.10	0.98	0.20
5.....			3.40	149.0	1.30	5.10	0.98	0.20
6.....			3.26	133.0	1.32	5.50	0.98	0.20
7.....			2.85	90.0	1.41	7.30	0.94	Nil.
8.....			2.42	55.0	1.49	9.30	0.90	"
9.....			1.99	30.0	1.47	8.80	0.91	"
10.....			1.94 ^a	27.0	1.50	9.60	0.95	"
11.....			1.89	24.0	1.56	11.30	0.95	"
12.....			1.82	21.0	1.61	12.80	0.91	"
13.....	2.17	40.0	2.86	91.0	1.39	6.90	0.91	"
14.....	3.77	193.0	2.97	102.0	1.35	6.10	0.91	"
15.....	3.75	191.0	2.91	96.0	1.33	5.70	0.91	"
16.....	4.43	273.0	3.15	120.0	1.32	5.50	0.91	"
17.....	2.55	65.0	2.75	82.0	1.17	2.90	0.91	"
18.....	2.35	50.0	2.26	45.0	1.15	2.60	0.91	"
19.....	2.20	41.0	2.08	34.0	1.12	2.10	0.91	"
20.....	2.02	31.0	1.87	24.0	1.09	1.66	0.91	"
21.....	2.04	32.0	1.93	26.0	1.05	1.10	0.91	"
22.....	1.92	26.0	1.78	19.3	1.03	0.82	0.91	"
23.....	1.72	16.8	1.61	12.8	0.97	0.10	0.91	"
24.....	1.59	12.2	1.60	12.5	1.95 ^a	Nil.	0.91	"
25.....	1.50 ^a	9.6	1.57	11.6	0.93	"	Dry.	"
26.....	1.45 ^a	8.3	1.53	10.4	0.99	0.30	"	"
27.....	1.40 ^a	7.1	1.49	9.3	0.98 ^a	0.20	"	"
28.....	1.40 ^a	7.1	1.45	8.3	0.97	0.10	"	"
29.....	1.50 ^a	9.6	1.41	7.3	0.97	0.10	"	"
30.....	1.95	28.0	1.35	6.1	0.97	0.10	"	"
31.....	2.01	31.0			0.95	0.00		

a Gauge height interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Gap Creek near Maple Creek, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.91	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	0.91	"	"	"	"	"	"	"
3.....	0.91	"	"	"	"	"	"	"
4.....	0.91	"	"	"	"	"	"	"
5.....	0.91	"	"	"	"	"	"	"
6.....	0.91	"	"	"	"	"	"	"
7.....	Dry.	"	"	"	"	"	"	"
8.....	"	"	"	"	"	"	"	"
9.....	"	"	"	"	"	"	"	"
10.....	"	"	"	"	"	"	2.00	27.0
11.....	"	"	"	"	"	"	2.04 ^a	29.0
12.....	"	"	"	"	"	"	2.08	31.0
13.....	"	"	"	"	"	"	1.87 ^a	21.0
14.....	"	"	"	"	"	"	1.66	12.7
15.....	"	"	"	"	2.00	27.0	1.48 ^a	7.2
16.....	"	"	"	"	1.50	7.7	1.30	3.3
17.....	"	"	"	"	1.32	3.5	Dry.	Nil.
18.....	"	"	"	"	Dry.	Nil.	"	"
19.....	"	"	"	"	"	"	"	"
20.....	"	"	"	"	"	"	"	"
21.....	"	"	"	"	"	"	"	"
22.....	"	"	"	"	"	"	"	"
23.....	"	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

^a Gauge height interpolated.

MONTHLY DISCHARGE of Gap Creek near Maple Creek, for 1914.

(Drainage area 274 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	373.00	7.10	56.00	0.2060	0.140	2,126
April.....	149.00	6.10	53.00	0.1950	0.220	3,178
May.....	12.80	0.00	4.10	0.0149	0.020	232
June.....	0.20	0.00	0.02	Nil.	0.000	Nil.
July.....						"
August.....						
September.....	27.00	0.00	1.27	0.0046	0.005	76
October.....	31.00	0.00	4.20	0.0154	0.020	260
The period.....					0.400	5,892

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MISCELLANEOUS DISCHARGE MEASUREMENTS made in Bigstake Lake drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Apr. 6.	H. O. Brown.	Maple Creek.	S-10-26-3.	18.3	14.5	1.75	25.00
Apr. 6.	do	A Coulee.	S-10-26-3.				0.14
July 24.	H. W. Rowley.	Branch Gap Creek.	NE. 20-8-27-3.				0.18
Sept. 8.	do	do	NE. 2-9-28-3.				0.69
Sept. 16.	do	do	SE. 33-8-28-3.				0.39
Oct. 9.	do	do	13-9-28-3.	25.2	61.5	1.66	102.00

MANY ISLAND LAKE DRAINAGE BASIN.

General Description.

Many Island Lake, about 25 square miles in area, is situated on the boundary line between the provinces of Alberta and Saskatchewan, about 10 miles north of the town of Walsh. It is the farthest west of the several lakes which receive the drainage of the north slope of the Cypress Hills. The water is shallow and alkaline. Its only source of water supply is Mackay Creek with its tributaries, Stony and Boxelder Creeks.

The topography of the basin is very rough, and the creek slopes are heavy. The basin is bare of trees except in the hills near the sources of the streams. The creek channels are deep, and the beds are mostly gravel.

As is the case in all prairie basins, the highest discharge occurs in April. All the streams of this drainage basin stop running in June or July and generally remain so for the remainder of the season.

In the lower part of the drainage basin near the lake, irrigation has been developed to some extent on hay meadows. In the upper part there are few irrigation schemes.

EAST BRANCH OF MACKAY CREEK AT GRANT'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 36, Tp. 10, Rge. 1, W. 4th Mer., at Arthur Grant's ranch.

Records available.—From October 13, 1911, to October 31, 1914.

Gauge.—Vertical staff; the zero of the gauge was maintained at 75.65 feet during 1911; 75.85 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Practically permanent.

Discharge measurements.—Made by wading or with a weir.

Winter flow.—Station discontinued during winter season.

Observer.—Mrs. I. B. Grant.

DISCHARGE MEASUREMENTS of East Branch of Mackay Creek at Grant's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 20.	R. J. Srigley	10.00	4.70	0.46	0.71	2.17
Mar. 30.	do	13.00	6.40	0.88	0.83	5.61
May 13.	H. W. Rowley	12.00	7.45	0.64	0.86	4.80
June 11.	do				0.33	Nil.
June 27.	do				Dry.	"
July 28.	do				"	"
Aug. 15.	do				"	"
Sept. 18.	do				"	"
Oct. 15.	do	8.00 ^a	2.80	0.83	0.73	2.32

^a Measurement made 500 feet above gauge.

DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Mackay Creek at Grant's Ranch,
for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.66	36.00	0.72	2.30	0.34	0.03
2.....			1.39	24.00	0.72	2.30	0.36	0.04
3.....			1.38	24.00	0.68	1.78	0.38	0.06
4.....			1.36	22.00	0.68	1.78	0.36	0.04
5.....			2.61	79.00	0.84	4.30	0.38	0.06
6.....			1.59	33.00	0.82	4.00	0.38	0.06
7.....			1.45	27.00	0.86	4.70	0.38	0.06
8.....			1.23	16.90	0.98	7.90	0.37	0.05
9.....			1.23	16.90	1.17	14.40	0.37	0.05
10.....			0.98	7.90	1.11	12.10	0.36	0.04
11.....			0.98	7.90	0.91	6.00	0.36	0.04
12.....			1.41	25.00	0.88	5.20	0.38	0.05
13.....	1.61	34.00	1.72	39.00	0.86	4.70	0.38	0.05
14.....	2.36	68.00	1.66	36.00	0.82	4.00	0.38	0.05
15.....	2.26	60.00	1.65	36.00	0.79	3.40	0.84	4.30
16.....	1.11	12.10	1.66	36.00	0.74	2.60	0.80	3.60
17.....	1.18	14.80	1.36	22.00	0.68	1.78	0.71	2.10
18.....	1.19	15.20	1.28	19.00	0.65	1.45	0.61	1.09
19.....	1.00 ^a	8.50	1.12	12.50	0.64	1.36	0.54	0.60
20.....	0.81	3.70	1.16	14.00	0.62	1.18	0.38	0.06
21.....	0.66	1.56	1.06	10.40	0.59	0.93	0.37	0.05
22.....	0.61	1.09	0.94	6.60	0.59 ^a	0.93	0.34	0.04
23.....	0.61	1.09	0.91	6.00	0.59	0.93	0.34	0.04
24.....	0.71	2.10	0.91	6.00	0.58	0.86	0.34	0.04
25.....	0.71	2.10	0.90	5.70	0.55	0.65	0.36	0.04
26.....	0.71	2.10	0.88	5.20	0.50	0.38	0.40	0.08
27.....	0.71	2.10	0.82	4.00	0.46	0.22	0.37	0.05
28.....	0.71	2.10	0.78	3.20	0.40	0.08	0.37	0.05
29.....	0.71	2.10	0.74	2.60	0.38	0.06	0.37	0.05
30.....	0.83	4.10	0.75	2.70	0.36	0.04	0.36	0.04
31.....	1.47	28.60			0.36	0.04		

^a Gauge height interpolated.

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DAILY GAUGE HEIGHT AND DISCHARGE of East Branch of Mackay Creek at Grant's Ranch,
for 1914.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.36	0.04	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	0.35	0.03	"	"	"	"	"	"
3.....	0.35	0.03	"	"	"	"	"	"
4.....	0.34	0.02	"	"	"	"	"	"
5.....	0.34	0.02	"	"	"	"	"	"
6.....	0.34	0.02	"	"	"	"	0.69	1.89
7.....	0.34	0.02	"	"	"	"	1.37	23.00
8.....	0.33	0.02	"	"	"	"	2.80	87.00
9.....	0.30 ^a	Nil.	"	"	"	"	1.72	39.00
10.....	0.27 ^a	"	"	"	"	"	1.29	19.40
11.....	0.23	"	"	"	"	"	1.02	9.10
12.....	0.22	"	"	"	"	"	0.84	4.30
13.....	0.19	"	"	"	"	"	0.70	2.00
14.....	Dry.	"	"	"	"	"	0.72	2.30
15.....	"	"	"	"	"	"	0.71	2.10
16.....	"	"	"	"	"	"	0.64	1.36
17.....	"	"	"	"	"	"	0.59	0.93
18.....	"	"	"	"	"	"	0.64	1.36
19.....	"	"	"	"	"	"	0.64	1.36
20.....	"	"	"	"	"	"	0.60	1.00
21.....	"	"	"	"	"	"	0.59	0.93
22.....	"	"	"	"	"	"	0.60	1.00
23.....	"	"	"	"	"	"	0.55	0.65
24.....	"	"	"	"	"	"	0.50	0.38
25.....	"	"	"	"	"	"	0.49	0.34
26.....	"	"	"	"	"	"	0.49	0.34
27.....	"	"	"	"	"	"	0.44	0.16
28.....	"	"	"	"	"	"	0.39	0.07
29.....	"	"	"	"	"	"	0.39	0.07
30.....	"	"	"	"	"	"	0.37	0.05
31.....	"	"	"	"	"	"	0.35	0.03

^a Gauge height interpolated.

MONTHLY DISCHARGE of East Branch of Mackay Creek at Grant's Ranch, for 1914.

(Drainage area 75 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	68.00	1.09	14.00	0.18700	0.130	526
April.....	79.00	2.70	19.60	0.26100	0.290	1,163
May.....	14.40	0.04	3.00	0.03970	0.050	183
June.....	4.30	0.03	0.43	0.00573	0.006	26
July.....	0.04	0.00	0.01	0.00009	Nil.	Nil.
August.....						
September.....						
October.....	87.00	0.00	6.40	0.08600	0.100	397
The period.....					0.58	2,295

WEST BRANCH OF MACKAY CREEK AT SCHNELL'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 27, Tp. 10, Rge. 1, W. 4th Mer., at Chris. Schnell's ranch.

Records available.—From September 20, 1912, to October 31, 1914.

Gauge.—Vertical staff; the zero of the gauge has been maintained at 91.66 feet, remaining unchanged since the station was established.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Composed of loose stones and gravel; liable to shift during flood stages.

Discharge measurements.—Made by wading or with a weir.

Winter flow.—Station discontinued during the winter season.

Observer.—Chris. Schnell.

DISCHARGE MEASUREMENTS of West Branch of Mackay Creek at Schnell's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 13.....	H. W. Rowley.....	<i>a</i>			1.14	0.14
June 11.....	do.....				0.85	Nil.
June 29.....	do.....				Dry.	"
July 28.....	do.....				"	"
Aug. 15.....	do.....				"	"
Sept. 18.....	do.....				"	"
Oct. 16.....	do.....	<i>a</i>			1.37	1.98

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of West Branch of Mackay Creek at Schnell's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.00	Nil.	2.22	21.00	1.06	0.02	0.95	Nil.
2.....	1.63	7.70	1.73	10.00	1.06	0.02	0.92	"
3.....	1.58	6.50	1.38	2.20	1.06	0.02	0.96	"
4.....	1.57	6.30	1.59	6.70	1.06	0.02	0.89	"
5.....	1.44	3.30	1.78	11.10	1.07	0.03	0.96	"
6.....	1.43	3.10	1.70	9.30	1.07	0.03	1.03	"
7.....	1.30	1.04	1.51	4.90	1.06	0.02	0.96	"
8.....	1.20	0.34	1.38	2.20	1.07	0.03	0.88	"
9.....	1.31	1.17	1.36	1.86	1.06	0.02	0.82	"
10.....	1.23	0.52	1.27	0.80	1.05	0.01	0.93	"
11.....	1.15	0.16	1.25	0.64	1.07	0.03	0.92	"
12.....	1.19	0.30	1.20	0.34	1.07	0.03	0.90	"
13.....	1.21	0.40	1.19	0.30	1.09	0.05	0.87	"
14.....	1.26	0.72	1.40	2.50	1.14	0.14	0.92	"
15.....	1.33	1.40	1.48	4.20	1.13	0.12	0.80	"
16.....	1.35	1.70	1.41	2.70	1.11	0.08	0.70	"
17.....	1.31	1.17	1.35	1.70	1.09	0.05	0.55	"
18.....	1.26	0.72	1.36	1.86	1.09	0.05	0.50	"
19.....	1.17	0.23	1.31	1.17	1.07	0.03	0.29	"
20.....	1.02	Nil.	1.24	0.58	1.06	0.02	0.23	"
21.....	1.04	"	1.18	0.27	1.06	0.02	0.21	"
22.....	1.00	"	1.16	0.20	1.06	0.02	0.19	"
23.....	0.98	"	1.14	0.14	1.05	0.01	0.18	"
24.....	0.97	"	1.13	0.12	1.08	0.04	0.17	"
25.....	0.96	"	1.09	0.05	1.08	0.04	0.16	"
26.....	0.96	"	1.09	0.05	1.06	0.02	0.44	"
27.....	1.04	"	1.08	0.04	1.04	Nil.	0.38	"
28.....	1.03	"	1.08	0.04	1.03	"	Dry.	"
29.....	0.98	"	1.07	0.03	1.02	"	"	"
30.....	1.00	"	1.07	0.03	1.00	"	"	"
31.....	2.47	27.00			0.99	"		

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DAILY GAUGE HEIGHT AND DISCHARGE of West Branch of Mackay Creek at Schnell's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	"	"
5.....	"	"	"	"	"	"	"	"
6.....	"	"	"	"	"	"	"	"
7.....	"	"	"	"	"	"	"	"
8.....	"	"	"	"	"	"	2.78	34.00
9.....	"	"	"	"	"	"	2.30	23.00
10.....	"	"	"	"	"	"	2.12	19.00
11.....	"	"	"	"	"	"	1.70	9.30
12.....	"	"	"	"	"	"	1.45	3.60
13.....	"	"	"	"	"	"	1.30	1.04
14.....	"	"	"	"	"	"	1.15	0.16
15.....	"	"	"	"	"	"	1.50	4.70
16.....	"	"	"	"	"	"	1.36	1.86
17.....	"	"	"	"	"	"	1.22	0.46
18.....	"	"	"	"	"	"	1.09	0.05
19.....	"	"	"	"	"	"	1.06	0.02
20.....	"	"	"	"	"	"	1.03	Nil.
21.....	"	"	"	"	"	"	1.00	"
22.....	"	"	"	"	"	"	0.97	"
23.....	"	"	"	"	"	"	0.92	"
24.....	"	"	"	"	"	"	0.87	"
25.....	"	"	"	"	"	"	0.86	"
26.....	"	"	"	"	"	"	0.85	"
27.....	"	"	"	"	"	"	0.84	"
28.....	"	"	"	"	"	"	0.81	"
29.....	"	"	"	"	"	"	0.79	"
30.....	"	"	"	"	"	"	0.89	"
31.....	"	"	"	"	"	"	0.86	"

MONTHLY DISCHARGE of West Branch of Mackay Creek at Schnell's Ranch, for 1914.

(Drainage area 88 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March.....	27.00	0.00	2.06	0.0234	0.030	127
April.....	21.00	0.03	2.90	0.0330	0.040	173
May.....	0.14	0.00	0.31	0.0036	0.004	19
June.....						Nil.
July.....						"
August.....						"
September.....						"
October.....	34.00	0.00	3.14	0.0357	0.040	193
The period.....					0.110	512

MACKAY CREEK AT WALSH.

Location.—On NW. $\frac{1}{4}$ Sec. 26, Tp. 11, Rge. 1, W. 4th Mer., at traffic bridge.

Records available.—July 29, 1909, to October 31, 1914.

Gauge.—Vertical staff; elevation, 2,432.65 feet above mean sea level, maintained since establishment.

Bench-mark.—Permanent iron bench-mark; elevation, 2,443.73 feet above mean sea level (Geodetic Survey of Canada).

Channel.—Composed of clay.

Discharge measurements.—Made from bridge, by wading, or with a weir.

Winter flow.—Station not maintained during winter.

Observer.—Edward Sept.

DISCHARGE MEASUREMENTS of Mackay Creek at Walsh, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 19.....	R. J. Srigley.....	15.0	14.8	0.96	1.28	14.10
Mar. 30.....	do.....				0.63	0.40
April 1.....	do.....	42.0	81.4	1.13	2.72	92.00
May 15.....	H. S. Kerby.....	9.1	14.3	0.31	0.75	4.50
June 11.....	do.....				Dry.	Nil.
July 28.....	do.....				"	"
Sept. 18.....	do.....				"	"
Oct. 15.....	H. W. Rowley.....				0.43	0.69

DAILY GAUGE HEIGHT AND DISCHARGE of Mackay Creek at Walsh, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-gt.</i>
1.....			2.71	91.00	0.60	2.20	Dry.	Nil.
2.....			2.14	47.00	0.58	2.00	"	"
3.....			1.78	31.00	0.56	1.80	"	"
4.....			1.35	16.00	0.55	1.70	"	"
5.....			1.86	34.00	0.54	1.62	"	"
6.....			2.50	72.00	0.80	4.90	"	"
7.....			1.78	31.00	0.78	4.60	"	"
8.....			1.36	16.30	0.84	5.50	"	"
9.....			1.06	9.40	1.02	8.60	"	"
10.....			1.02	8.60	1.29	14.60	"	"
11.....	0.44	0.94	0.99	8.00	1.15	11.30	"	"
12.....	0.36	0.46	1.05	9.20	0.98	7.80	"	"
13.....	0.39	0.64	1.48	19.80	0.88	6.10	"	"
14.....	2.02	41.00	1.67	27.00	0.78	4.60	"	"
15.....	2.14	47.00	1.90	36.00	0.72	3.80	"	"
16.....	1.52	21.00	1.60	24.00	0.64	2.70	"	"
17.....	0.94	7.10	1.70	28.00	0.60	2.20	"	"
18.....	0.94	7.10	1.44	18.60	0.56	1.80	"	"
19.....	1.12	10.60	1.25	13.60	0.52	1.46	"	"
20.....	0.77	4.50	1.19	12.20	0.44	0.94	"	"
21.....	0.46	1.06	1.26	13.80	0.39	0.64	"	"
22.....	0.46	1.06	1.06	9.40	0.38	0.58	"	"
23.....	0.32	0.28	0.94	7.10	0.35	0.40	"	"
24.....	0.29	0.18	0.92	6.80	0.40	0.70	"	"
25.....	0.52	0.14a	0.92	6.80	0.30	0.20	"	"
26.....	0.52	0.10a	0.86	5.80	0.17	0.02	"	"
27.....	0.04	0.05a	0.80	4.90	0.08	0.00	"	"
28.....	0.00	0.01a	0.72	3.80	0.02	0.00	"	"
29.....	0.04	0.05a	0.66	2.90	Dry.	Nil.	"	"
30.....	0.31	0.40a	0.63	2.60	"	"	"	"
31.....	2.22	52.00			"	"		

a Stream frozen; discharge estimated.

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DAILY GAUGE HEIGHT AND DISCHARGE of Mackay Creek at Walsh, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	0.89	6.20
5.....	"	"	"	"	"	"	0.86	5.80
6.....	"	"	"	"	"	"	0.67	3.10
7.....	"	"	"	"	"	"	0.86	5.80
8.....	"	"	"	"	"	"	2.74	94.00
9.....	"	"	"	"	"	"	3.06	126.00
10.....	"	"	"	"	"	"	2.28	56.00
11.....	"	"	"	"	"	"	1.50	20.00
12.....	"	"	"	"	"	"	1.06	9.40
13.....	"	"	"	"	0.94	7.10	0.79	4.80
14.....	"	"	"	"	0.64	2.70	0.55	1.70
15.....	"	"	"	"	0.16	0.01	0.44	0.94
16.....	"	"	"	"	0.06	0.00	0.50	1.30
17.....	"	"	"	"	0.01	0.00	0.48	1.18
18.....	"	"	"	"	Dry.	Nil.	0.30	0.20
19.....	"	"	"	"	"	"	0.22	0.07
20.....	"	"	"	"	"	"	0.15	0.00
21.....	"	"	"	"	"	"	0.11	0.00
22.....	"	"	"	"	"	"	0.08	0.00
23.....	"	"	"	"	"	"	0.06	0.00
24.....	"	"	"	"	"	"	0.02	0.00
25.....	"	"	"	"	"	"	Dry.	Nil.
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

MONTHLY DISCHARGE of Mackay Creek at Walsh, for 1914.

(Drainage area 200 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (11-31).....	52.00	0.01	9.32	0.047	0.036	387
April.....	91.00	2.60	20.60	0.103	0.115	1,226
May.....	14.60	0.00	2.99	0.015	0.017	184
June.....						Nil.
July.....						"
August.....						"
September.....	7.10	0.00	0.33	0.016	0.018	196
October.....	126.00	0.00	10.80	0.054	0.062	664
The period.....					0.248	2,657

BOXELDER CREEK AT YOUNG'S RANCH.

Location.—On the NE. $\frac{1}{4}$ Sec. 2, Tp. 12, Rge. 30, W. 3rd Mer., two miles east of Walsh.

Records available.—March 11, 1911, to October 31, 1914. Discharge measurements from 1909.

Gauge.—Vertical staff; elevation of zero maintained at 88.83 feet since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Clay.

Discharge measurements.—Made by wading; during flood stages, from railway bridge downstream.

Winter flow.—Station not maintained during the winter.

Observer.—John Young.

DISCHARGE MEASUREMENTS of Boxelder Creek at Young's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 30.....	R. J. Srigley.....				Dry.	Nil.
April 1.....	do.....	14.5	22.90	0.78	2.54	17.80
May 15.....	H. S. Kerby.....					Nil. <i>a</i>
June 11.....	do.....				Dry.	" <i>a</i>
July 28.....	H. W. Rowley.....				"	" <i>a</i>
Sept. 18.....	do.....				"	" <i>a</i>

a Water standing in pools.

DAILY GAUGE HEIGHT AND DISCHARGE of Boxelder Creek at Young's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.54	17.90		Nil.	Dry.	Nil.
2.....			2.25	11.80		"	"	"
3.....	2.40	14.80	1.95	7.10		"	"	"
4.....	2.70	22.00	1.82	5.60		"	"	"
5.....	2.35	13.80	1.88	6.20		"	"	"
6.....	2.05	8.50	2.92	27.00		"	"	"
7.....	2.05	8.50	2.40	14.80		"	"	"
8.....	1.45	2.30	1.72	4.60		"	"	"
9.....	1.35	1.72	1.42	2.10		"	"	"
10.....	1.20	1.05	1.40	2.00		"	"	"
11.....	1.15	0.88	1.30	1.45	1.70	4.30	"	"
12.....	1.30	1.45	1.25	1.25	1.75	4.80	"	"
13.....	1.42	2.10	1.55	3.00	1.42	2.10	"	"
14.....	2.40	14.80	2.13	10.10	1.00	0.45	"	"
15.....	2.75	23.00	2.03	8.50	0.60	0.02 <i>a</i>	"	"
16.....	2.78	24.00	2.20	10.90	0.40	Nil. <i>b</i>	"	"
17.....	1.68	4.20	1.95	7.10	Dry.	"	"	"
18.....	1.35	1.72	1.75	4.80	"	"	"	"
19.....	0.95	0.38	1.60	3.40	"	"	"	"
20.....	0.65	0.04	1.45	2.30	"	"	"	"
21.....	0.60	0.02	1.28	1.37	"	"	"	"
22.....	0.50	0.00	1.20	1.05	"	"	"	"
23.....	0.15	0.00	1.15	0.88	"	"	"	"
24.....	0.00	0.00	0.90	0.30	"	"	"	"
25.....		Nil. <i>a</i>	0.50	0.00	"	"	"	"
26.....		"	0.15	0.00	"	"	"	"
27.....		"		Nil. <i>a</i>	"	"	"	"
28.....		"		"	"	"	"	"
29.....		"		"	"	"	"	"
30.....	Dry.	"		"	"	"	"	"
31.....	"	"		"	"	"	"	"

a Water standing in pools.

b Creek dry from May 16th to October 7th.

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DAILY GAUGE HEIGHT AND DISCHARGE of Boxelder Creek at Young's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.
2.....	"	"	"	"	"	"	"	"
3.....	"	"	"	"	"	"	"	"
4.....	"	"	"	"	"	"	"	"
5.....	"	"	"	"	"	"	"	"
6.....	"	"	"	"	"	"	"	"
7.....	"	"	"	"	"	"	"	"
8.....	"	"	"	"	"	"	1.70	4.30
9.....	"	"	"	"	"	"	3.20	35.00
10.....	"	"	"	"	"	"	3.55	47.00
11.....	"	"	"	"	"	"	2.22	11.30
12.....	"	"	"	"	"	"	1.55	3.00
13.....	"	"	"	"	"	"	1.52	2.80
14.....	"	"	"	"	"	"	1.35	1.72
15.....	"	"	"	"	"	"	0.96	0.39
16.....	"	"	"	"	"	"	0.65	0.04
17.....	"	"	"	"	"	"	0.20	0.00
18.....	"	"	"	"	"	"	Nil.	<i>a</i>
19.....	"	"	"	"	"	"	"	"
20.....	"	"	"	"	"	"	"	"
21.....	"	"	"	"	"	"	"	"
22.....	"	"	"	"	"	"	"	"
23.....	"	"	"	"	"	"	"	"
24.....	"	"	"	"	"	"	"	"
25.....	"	"	"	"	"	"	"	"
26.....	"	"	"	"	"	"	"	"
27.....	"	"	"	"	"	"	"	"
28.....	"	"	"	"	"	"	"	"
29.....	"	"	"	"	"	"	"	"
30.....	"	"	"	"	"	"	"	"
31.....	"	"	"	"	"	"	"	"

a Water standing in pools.

MONTHLY DISCHARGE of Boxelder Creek at Young's Ranch, for 1914.

(Drainage area 104 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (3-31).....	24.00	Nil.	5.01	0.048	0.052	288
April.....	27.00	"	5.19	0.050	0.056	309
May.....	4.80	"	0.38	0.004	0.005	23
June.....	"	"	"	"	"	Nil.
July.....	"	"	"	"	"	"
August.....	"	"	"	"	"	"
September.....	"	"	"	"	"	"
October.....	47.00	Nil.	3.41	0.033	0.038	210
The period.....	"	"	"	"	0.151	830

ROSS CREEK DRAINAGE BASIN.

General Description.

Ross Creek rises in Elkwater Lake, a small body of water covering an area of approximately two square miles, situated in Township 8, Range 3, West of the 4th Meridian. The creek flows in a northerly direction as far as Irvine, and then turns sharply to the westward and closely parallels the main line of the Canadian Pacific Railway to Medicine Hat. Here it is joined by Sevenpersons River, and the combined flow empties into the South Saskatchewan in Section 32, Township 12, Range 5, West of the 4th Meridian. The tributaries of Ross Creek are Bullshead Creek, which joins it in Section 21, Township 12, Range 5, West of the 4th Meridian, and Gros Ventre Creek, which joins it in Section 14, Township 11, Range 3, West of the 4th Meridian.

The topography of this basin is exceedingly rough and rolling, and almost totally devoid of tree growth. The one exception is a small area of the Forest Reserve just south of Elkwater Lake, which has a good stand of pine and spruce.

The Canadian Pacific Railway takes the water supply for its tank at Irvine from Ross Creek.

ROSS CREEK AT KOENIG'S RANCH.

Location.—On the SE. $\frac{1}{4}$ Sec. 36, Tp. 9, Rge. 3, W. 4th Mer., at G. Koenig's ranch, one mile below the former station on Ross Creek at James Robinson's ranch.

Records available.—At the original station at Robinson's ranch, NW. $\frac{1}{4}$ Sec. 24, Tp. 9, Rge. 3, W. 4th Mer., from October 11, 1911, to May 6, 1914; at the new station, established May 15, 1914, at Koenig's ranch, SE. $\frac{1}{4}$ Sec. 36, Tp. 9, Rge. 3, W. 4th Mer., from May 15 to October 31, 1914.

Gauge.—Vertical staff at both stations. Station at Robinson's ranch: The zero of the gauge was maintained at 93.34 feet during 1911; at 93.00 feet during 1912; and at 93.12 feet during 1913 and to May 6, 1914. Station at Koenig's ranch: The zero of the gauge was maintained at 94.94 feet during 1914.

Bench-marks.—Permanent iron bench-marks at both locations of stations. At Koenig's ranch the bench-mark is located on the left bank 150 feet NE. of the NE. corner of G. Koenig's horse barn, and 495 feet north of section line between Secs. 25 and 36; assumed elevation, 100.09 feet.

Channel.—Practically permanent.

Winter flow.—Station discontinued during winter season.

Observer.—Mr. G. Koenig.

DISCHARGE MEASUREMENTS of Ross Creek at Koenig's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 23b	R. J. Srigley				3.85	3.00a
May 15	H. W. Rowley	10.5	3.78	0.64	1.16	3.68
June 12	do	10.0	4.80	0.40	1.05	1.92
June 29	do	5.5c	1.15	0.84	0.98	0.96
June 29b	do	6.5	2.12	0.56	1.38	1.19
July 29	do					Nil.
July 29b	do	d				0.31
Aug. 15	do					Nil.
Aug. 15b	do	d			1.27	0.24
Sept. 19	do				0.83	0.30
Sept. 19b	do	d			1.28	0.40
Oct. 16	do	12.0	7.90	0.91	1.29	6.99
Oct. 17b	do	12.0	6.00	1.16	1.59	6.90

a Discharge estimated; ice conditions.

b Measurement and gauge height taken at station at Robinson's ranch.

c Measurement made below gauge.

d Weir measurement.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Ross Creek at Koenig's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			4.38 ^a	9.00	0.97	0.00	0.88	0.46
2.....			4.33 ^a	10.00	1.13	0.02	1.04	1.60
3.....			2.83 ^a	12.00	1.22	0.11	1.14	3.20
4.....			2.78 ^a	10.00	1.26	0.25	1.18	4.10
5.....			1.55	4.90	1.28	0.35	1.20	1.60
6.....			2.40	56.00	1.32	0.61	1.24	5.60
7.....			1.89	25.00	.....^b	.....	1.20	4.60
8.....			1.44	2.10	.....^b	.....	1.17	3.90
9.....			1.17	0.01	.....^b	.....	1.11	2.70
10.....			1.10	0.00	.....^b	.....	1.06	1.86
11.....			1.50	3.40	.....^b	.....	1.05	1.70
12.....			1.71	14.10	.....^b	.....	1.04	1.60
13.....			1.62	8.70	.....^b	.....	1.10	2.50
14.....			1.57	5.90	.....^b	.....	1.14	3.20
15.....			1.56	5.40	1.15	3.40	1.14	3.20
16.....			1.61	8.10	1.14	3.20	1.12	2.90
17.....			1.71	14.10	1.12	2.90	1.02	1.40
18.....			1.66	11.10	1.10	2.50	0.97	0.98
19.....			1.69	12.90	1.08	2.20	0.90	0.54
20.....			1.66	11.10	1.08	2.20	0.83	0.29
21.....			1.64	9.90	1.08	2.20	0.84	0.32
22.....			1.64	9.90	1.09	2.30	0.87	0.42
23.....			1.63	9.30	1.08	2.20	0.80	0.22
24.....			1.60	7.50	1.06	1.86	0.78	0.19
25.....			1.58	6.50	1.02	1.40	1.03	1.50
26.....			1.56	5.40	1.00	1.20	1.01	1.30
27.....			1.56	5.40	0.98	1.06	0.98	1.06
28.....			1.55	4.90	0.95	0.84	0.96	0.91
29.....	4.24 ^a	7.00	1.54	4.60	0.92	0.66	0.98	1.06
30.....	4.40 ^a	8.00	1.54	4.60	0.90	0.54	0.93	0.72
31.....	4.34 ^a	8.00			0.88	0.46		

^a Ice conditions; discharge estimated.^b No gauge height records.^c March 29 to May 6, records are for the station at Robinson's ranch; May 15 to October 31, records are for the station at Koenig's ranch.

DAILY GAUGE HEIGHT AND DISCHARGE of Ross Creek at Koenig's Ranch, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	0.88	0.46	Dry.	Nil.	0.80	0.22	0.84	0.32
2.....	0.78	0.19	"	"	0.84	0.32	0.85	0.34
3.....	0.70	0.08	"	"	0.80	0.22	0.92	0.66
4.....	0.55	0.01	"	"	0.78	0.15	0.96	0.91
5.....	0.46	0.00	"	"	0.79	0.20	1.02	1.40
6.....	0.78	0.19	"	"	0.80	0.22	1.10	2.50
7.....	0.71	0.09	"	"	0.79	0.20	1.16	3.60
8.....	0.62	0.03	"	"	0.82	0.27	1.32	7.90
9.....	0.46	Nil.	"	"	0.82	0.27	1.38	9.50
10.....	Dry.	"	"	"	0.82	0.27	1.43	10.90
11.....	"	"	"	"	0.82	0.27	1.34	8.40
12.....	"	"	"	"	0.88	0.46	1.23	5.40
13.....	"	"	"	"	1.36	9.00	1.32	7.90
14.....	"	"	0.60	0.02	1.30	7.30	1.38	9.50
15.....	"	"	Dry.	Nil.	1.30	7.30	1.32	7.90
16.....	"	"	"	"	0.88	0.46	1.27	6.50
17.....	"	"	"	"	0.86	0.38	1.24	5.60
18.....	"	"	"	"	0.84	0.32	1.20	4.60
19.....	"	"	0.72	0.10	0.83	0.29	1.21	4.90
20.....	"	"	0.73	0.12	0.85	0.34	1.19	4.40
21.....	"	"	0.70	0.08	0.86	0.38	0.15	3.40
22.....	"	"	0.75	0.14	0.84	0.32	1.14	3.20
23.....	"	"	0.98	1.06	0.84	0.32	1.11	2.70
24.....	"	"	0.99	1.13	0.84	0.32	1.10	2.50
25.....	"	"	1.00	1.20	0.84	0.32	1.06	1.86
26.....	"	"	0.87	0.42	0.85	0.34	1.04	1.60
27.....	"	"	0.94	0.78	0.84	0.32	1.06	1.86
28.....	"	"	0.91	0.60	0.84	0.32	1.05	1.70
29.....	"	"	0.91	0.60	0.85	0.34	1.05	1.70
30.....	"	"	0.88	0.46	0.84	0.32	1.05	1.70
31.....	"	"	0.80	0.22	.....	.....	1.01	1.30

MONTHLY DISCHARGE of Ross Creek at Koenig's Ranch, for 1914.

(Drainage area 43 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (29-31).....	8.00	7.00	7.70	0.1780	0.0200	46
April.....	56.00	0.00	9.70	0.2260	0.2500	579
May (1-6a) (15-31).....	3.40	0.00	1.41	0.0328	0.0300	64
June.....	5.60	0.19	1.95	0.0450	0.0500	116
July.....	0.46	0.00	0.03	0.0008	0.0009	2
August.....	1.20	0.00	0.22	0.0050	0.0060	14
September.....	9.00	0.19	1.06	0.0200	0.0300	63
October.....	10.90	0.32	4.10	0.1000	0.1100	251
The period.....					0.5000	1,135

a Records, March 29 to May 6, are for the original station at Robinson's ranch; May 15 to October 31, are for the new station at Koenig's ranch.

SESSIONAL PAPER No. 25c

GROS VENTRE CREEK AT TOTHILL'S RANCH.

Location.—On the SE. $\frac{1}{4}$ Sec. 27, Tp. 9, Rge. 4, W. 4th Mer., at Alf. Tothill's ranch.

Records available.—October 10, 1911, to October 31, 1914.

Gauge.—Vertical staff; the zero of the gauge has been maintained at 82.89 feet since the station was established.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Practically permanent.

Observer.—Mrs. Kate Tothill.

DISCHARGE MEASUREMENTS of Gros Ventre Creek at Tothill's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 15.....	H. W. Rowley.....	<i>a</i>			0.60	0.44
June 12.....	do.....	<i>a</i>			0.50	0.11
June 30.....	do.....	<i>a</i>				Nil.
July 29.....	do.....					"
Aug. 15.....	do.....					"
Sept. 19.....	do.....					"
Oct. 17.....	do.....	<i>a</i>			0.60	0.70

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Gros Ventre Creek at Tothill's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.93	76.00	0.61	0.58	<i>a</i>	Nil.
2.....			1.33	26.00	0.60	0.50	<i>a</i>	"
3.....			1.24	20.00	0.58	0.40	<i>a</i>	"
4.....			1.36	28.00	0.68	1.20	0.47	0.07
5.....			1.62	49.00	0.70	1.40	0.54	0.22
6.....			1.30	24.00	0.68	1.20	0.59	0.45
7.....			1.11	13.50	0.78	2.60	0.62	0.66
8.....			0.93	6.20	0.94	6.50	0.60	0.50
9.....			0.88	4.70	0.99	8.20	0.56	0.30
10.....			0.84	3.70	0.94	6.50	0.52	0.16
11.....			0.78	2.60	0.80	2.90	0.50	0.10
12.....			0.88	4.70	0.73	1.80	0.50	0.10
13.....	1.82	66.00	0.96	7.10	0.70	1.40	0.47	0.07
14.....	1.68	54.00	0.97	7.50	0.65	0.90	0.49	0.09
15.....	1.34	27.00	0.91	5.50	0.62	0.66	0.46	0.06
16.....	1.36	28.00	0.94	6.50	0.58	0.40	0.44	0.05
17.....	1.32	25.00	0.84	3.70	0.56	0.30	0.41	0.02
18.....	1.29	23.00	0.78	2.60	0.54	0.22	0.38	0.01
19.....	1.46	36.00	0.76	2.20	0.53	0.19	<i>a</i>	Nil.
20.....	1.40	31.00	0.78	2.60	0.52	0.16	<i>a</i>	"
21.....	1.42	32.00	0.78	2.60	0.52	0.16	<i>a</i>	"
22.....	1.52	40.00	0.72	1.66	0.52	0.16	<i>a</i>	"
23.....	1.44	34.00	0.71	1.53	0.51	0.13	<i>a</i>	"
24.....	1.18	16.70	0.74	1.92	0.52	0.16	<i>a</i>	"
25.....	1.04	10.10	0.74	1.92	0.50	0.10	<i>a</i>	"
26.....	1.09	12.20	0.71	1.53	0.44	0.05	<i>a</i>	"
27.....	0.83	3.50	0.67	1.10	0.40	0.02	<i>a</i>	"
28.....	0.87	4.40	0.66	1.00	0.38	0.01	<i>a</i>	"
29.....	1.12	13.70	0.66	1.00	<i>a</i>	Nil.	<i>a</i>	"
30.....	2.73	145.00	0.62	0.66	<i>a</i>	"	<i>a</i>	"
31.....	2.39	116.00			<i>a</i>	"	<i>a</i>	"

a Water standing in pools.

DAILY GAUGE HEIGHT AND DISCHARGE at Gros Ventre Creek at Tothill's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	a	Nil.	Dry.	Nil.	Dry.	Nil.	a	Nil.
2.....	a	"	"	"	"	"	a	"
3.....	a	"	"	"	"	"	a	"
4.....	a	"	"	"	"	"	a	"
5.....	a	"	"	"	"	"	0.88	4.70
6.....	a	"	"	"	"	"	0.68	1.20
7.....	Dry.	"	"	"	"	"	0.70	1.40
8.....	"	"	"	"	"	"	0.98	7.80
9.....	"	"	"	"	"	"	1.07	11.40
10.....	"	"	"	"	"	"	1.16	15.60
11.....	"	"	"	"	"	"	0.96	7.10
12.....	"	"	"	"	"	"	0.80	2.90
13.....	"	"	"	"	"	"	0.74	1.92
14.....	"	"	"	"	0.72	1.66	0.73	1.80
15.....	"	"	"	"	0.50	0.10	0.66	1.00
16.....	"	"	"	"	0.42	0.03	0.62	0.66
17.....	"	"	"	"	0.34	0.00	0.60	0.50
18.....	"	"	"	"	0.32	0.00	0.60	0.50
19.....	"	"	"	"	a	Nil.	0.58	0.40
20.....	"	"	"	"	a	"	0.54	0.22
21.....	"	"	"	"	a	"	0.54	0.22
22.....	"	"	"	"	a	"	0.53	0.19
23.....	"	"	"	"	a	"	0.52	0.16
24.....	"	"	"	"	a	"	0.52	0.16
25.....	"	"	"	"	a	"	0.52	0.16
26.....	"	"	"	"	a	"	0.51	0.13
27.....	"	"	"	"	a	"	0.52	0.16
28.....	"	"	"	"	a	"	0.52	0.16
29.....	"	"	"	"	a	"	0.51	0.13
30.....	"	"	"	"	a	"	0.51	0.13
31.....	"	"	"	"	a	"	0.51	0.13

a Water standing in pools.

MONTHLY DISCHARGE of Gros Ventre Creek at Tothill's Ranch, for 1914.

(Drainage area 39 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (13-31).....	145.00	3.50	38.00	0.9700	0.690	1,421
April.....	76.00	0.66	10.40	0.2660	0.300	618
May.....	8.20	0.00	1.25	0.0320	0.040	77
June.....	0.66	0.00	0.10	0.0024	0.003	6
July.....						Nil.
August.....	1.66	Nil.	0.06	0.0015	0.002	4
September.....	15.60	"	1.96	0.0500	0.060	120
October.....						
The period.....					1.100	2,246

ROSS CREEK AT IRVINE.

Location.—On NW. $\frac{1}{4}$ Sec. 31, Tp. 11, Rge. 2, W. 4th Mer., at traffic bridge in town of Irvine, and about 400 yards below the Canadian Pacific Railway Company's dam.

Records available.—July 28, 1909, to October 31, 1914.

Gauge.—Staff; the elevation of the zero of the gauge (2,477.79 feet) has been unchanged since establishment.

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Bench-mark.—Permanent iron bench-mark; elevation, 2,500.43 feet above mean sea level (Geodetic Survey).

Channel.—Shifting.

Discharge measurements.—From traffic bridge, by wading, or with weir.

Winter flow.—Observations discontinued during winter.

Artificial control.—Canadian Pacific Railway Company have a dam about 400 yards above station.

Diversions.—Canadian Pacific Railway Company pump water from creek for their water tank at Irvine.

Observer.—H. J. Price.

DISCHARGE MEASUREMENTS of Ross Creek at Irvine, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 18.....	R. J. Strigley.....	9.5	9.28	1.24	1.52	11.50
Mar. 21.....	do.....	9.5	4.67	0.79	1.14	3.70
Mar. 27.....	do.....	5.0	1.00	0.25	0.79	0.25
Mar. 31.....	do.....	43.0	178.00	1.72	6.83	306.00
April 2.....	H. S. Kerby.....	25.0	49.90	1.82	3.43	90.40
May 15.....	do.....	6.7	5.61	1.02	1.18	5.76
June 11.....	do.....				0.85	0.63a
June 30.....	do.....				0.70	Nil.
July 31.....	do.....				0.70	"
Oct. 12.....	do.....	10.4	14.1	1.21	1.56	17.00

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Ross Creek at Irvine, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	3.00	69.0	7.20	331.0	1.07	3.40	0.70	Nil.
2.....	2.80	60.0	3.50	95.0	1.04	2.80	0.69	"
3.....	2.64	52.0	2.73	56.0	1.02	2.40	0.68	"
4.....	2.40	42.0	2.72	56.0	1.00	2.00	0.66	"
5.....	2.28	37.0	2.70	55.0	1.00	2.00	0.64	"
6.....	2.00	27.0	2.70	55.0	1.07	3.40	0.58	"
7.....	1.94	25.0	2.68	54.0	2.00	27.00	0.56	"
8.....	1.90	24.0	2.65	52.0	2.50	46.00	0.65	"
9.....	1.76	20.0	2.60	50.0	2.20	34.00	0.69	"
10.....	1.69	17.7	2.55	48.0	1.90	24.00	0.75	0.15
11.....	1.64	16.2	2.50	46.0	1.62	15.60	0.85	0.60
12.....	1.58	14.5	2.45	44.0	1.54	13.50	0.84	0.54
13.....	1.50	12.5	2.42	43.0	1.50	12.50	0.83	0.48
14.....	1.50	12.5	2.38	41.0	1.46	11.50	0.82	0.42
15.....	1.50	12.5	2.30	38.0	1.19	5.80	0.81	0.36
16.....	1.67	17.1	2.25	36.0	1.09	3.80	0.80	0.30
17.....	1.67	17.1	2.13	31.0	1.07	3.40	0.79	0.27
18.....	1.66	16.8	2.00	27.0	1.04	2.80	0.78	0.24
19.....	1.25	7.0	1.80	21.0	0.98	1.78	0.77	0.21
20.....	1.28	7.6	1.64	16.2	0.93	1.23	0.75	0.15
21.....	1.27	7.4	1.45	11.2	0.89	0.84	0.74	0.12
22.....	1.27	7.4	1.37	9.4	0.84	0.54	0.73	0.09
23.....	1.27	7.4	1.30	8.0	0.81	0.36	0.70	Nil.
24.....	1.40	10.0	1.30	8.0	0.79	0.27	0.70	"
25.....	1.52	13.0	1.32	8.4	0.79	0.27	0.70	"
26.....	1.79	21.0	1.29	7.8	0.76	0.18	0.70	"
27.....	1.42	10.5	1.24	6.8	0.76	0.18	0.70	"
28.....	1.44	11.0	1.21	6.2	0.72	0.06	0.70	"
29.....	1.46	11.5	1.18	5.6	0.71	0.03	0.70	"
30.....	2.52	47.0	1.12	4.4	0.71	0.03	0.70	"
31.....	5.40	213.0			0.71	0.03		

DAILY GAUGE HEIGHT AND DISCHARGE of Ross Creek at Irvine, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	0.70	Nil.	0.70	Nil.	0.70	Nil.	0.70	Nil.
2.....	0.70	"	0.70	"	0.70	"	0.70	"
3.....	0.70	"	0.70	"	0.70	"	0.70	"
4.....	0.70	"	0.70	"	0.70	"	2.10	30.00
5.....	0.70	"	0.70	"	0.70	"	2.20	34.00
6.....	0.70	"	0.70	"	0.70	"	2.25	36.00
7.....	0.70	"	0.70	"	0.70	"	2.25	36.00
8.....	0.70	"	0.70	"	0.70	"	2.08	29.00
9.....	0.70	"	0.70	"	0.70	"	2.00	27.00
10.....	0.70	"	0.70	"	0.70	"	1.80	21.00
11.....	0.70	"	0.70	"	0.70	"	1.56	14.00
12.....	0.70	"	0.70	"	0.70	"	1.45	11.20
13.....	0.70	"	0.70	"	0.70	"	1.40	10.00
14.....	0.70	"	0.70	"	0.70	"	1.30	8.00
15.....	0.70	"	0.70	"	0.70	"	1.20	6.00
16.....	0.70	"	0.70	"	0.70	"	1.10	4.00
17.....	0.70	"	0.70	"	0.70	"	1.00	2.00
18.....	0.70	"	0.70	"	0.70	"	0.98	1.78
19.....	0.70	"	0.70	"	0.70	"	0.96	1.56
20.....	0.70	"	0.70	"	0.70	"	0.90	0.90
21.....	0.70	"	0.70	"	0.70	"	0.90	0.90
22.....	0.70	"	0.70	"	0.70	"	0.86	0.66
23.....	0.70	"	0.70	"	0.70	"	0.85	0.60
24.....	0.70	"	0.70	"	0.70	"	0.83	0.48
25.....	0.70	"	0.70	"	0.70	"	0.82	0.42
26.....	0.70	"	0.70	"	0.70	"	0.80	0.30
27.....	0.70	"	0.70	"	0.70	"	0.75	0.15
28.....	0.70	"	0.70	"	0.70	"	0.78	0.24
29.....	0.70	"	0.70	"	0.70	"	0.74	0.12
30.....	0.70	"	0.70	"	0.70	"	0.70	Nil.
31.....	0.70	"	0.70	"			0.70	"

MONTHLY DISCHARGE of Ross Creek at Irvine, for 1914.

(Drainage area 248 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March.....	213.0	7.00	28.00	0.1130	0.1300	1,722
April.....	331.0	4.40	42.00	0.1690	0.1890	2,499
May.....	46.0	0.03	7.20	0.0290	0.0330	442
June.....	0.6		0.13	0.0005	0.0006	8
July.....						Nil.
August.....						"
September.....						"
October.....	36.0		9.90	0.0400	0.0460	609
The period.....					0.3986	5,280

SESSIONAL PAPER No. 25c

BULLSHEAD CREEK AT CLARK'S RANCH.

Location.—On the NW. $\frac{1}{4}$ Sec. 15, Tp. 9, Rge. 5, W. 4th Mer., at Clark's ranch.

Records available.—October 9, 1911, to October 31, 1914.

Gauge.—Vertical staff; the zero of the gauge has been maintained at 88.45 feet since the station was established.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Practically permanent.

Winter flow.—Station discontinued during winter season.

Diversions.—Water is diverted by Clark Brothers above this station for irrigation purposes.

Observer.—W. E. Clark.

DISCHARGE MEASUREMENTS of Bullshead Creek at Clark's Ranch, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 17.....	R. J. Srigley.....	30.0	28.5	0.66	1.95	18.70
April 7.....	do.....	26.0	22.5	0.65	1.73	14.80
May 16.....	H. W. Rowley.....	<i>a</i>			1.33	0.78
June 12.....	do.....	<i>a</i>			1.08	0.26
July 3.....	do.....				0.92	Nil.
July 29.....	do.....				0.56	"
Aug. 21.....	do.....				0.54	"
Sept. 23.....	do.....	<i>a</i>			0.95	0.02
Oct. 17.....	do.....	<i>a</i>			1.22	1.74

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Bullshead Creek at Clark's Ranch, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			1.90 <i>a</i>	20.00	1.18	1.18	0.92	Nil.
2.....			1.90 <i>a</i>	20.00	1.17	1.07	1.12	0.61
3.....			2.00 <i>a</i>	25.00	1.15	0.85	1.17	1.07
4.....			2.30 <i>a</i>	34.00	1.15	0.85	1.13	0.69
5.....			1.65 <i>a</i>	11.70	1.17	1.07	1.13	0.69
6.....			1.50 <i>a</i>	7.40	1.22	1.68	1.13	0.69
7.....			1.86	19.70	1.27	2.50	1.13	0.69
8.....			1.72	14.40	1.33	3.60	1.10	0.45
9.....			1.68	13.00	1.40	5.10	1.03	0.14
10.....			1.49	7.30	1.44	6.10	0.96	0.01
11.....			1.68	13.00	1.33	3.60	0.96	0.01
12.....			1.84	18.90	1.22	1.68	1.04	0.17
13.....			1.92	22.00	1.18	1.18	1.06	0.25
14.....			1.87	20.00	1.14	0.77	1.03	0.14
15.....			1.80	17.40	1.13	0.69	1.03	0.14
16.....			1.68	13.00	1.13	0.69	1.01	0.08
17.....	2.00	21.00	1.57	9.60	1.13	0.69	1.00	0.05
18.....	1.85	15.20	1.49	7.30	1.12	0.61	0.96	0.01
19.....	1.76	12.30	1.46	6.60	1.10	0.45	0.95	Nil.
20.....	1.65	9.20	1.41	5.30	1.08	0.35	0.98	0.03
21.....	1.55	6.80	1.34	3.80	1.08	0.35	0.98	0.03
22.....	1.50	5.60	1.34	3.80	1.08	0.35	0.98	0.03
23.....	1.64	9.40	1.33	3.60	1.06	0.25	0.98	0.03
24.....	1.68	10.80	1.31	3.20	1.03	0.14	0.97	0.02
25.....	1.70	11.70	1.30	3.00	1.01	0.08	1.02	0.11
26.....	1.70	11.80	1.27	2.50	0.98	0.03	1.03	0.14
27.....	1.70	12.00	1.24	1.96	0.96	0.01	1.02	0.11
28.....	1.68	11.60	1.23	1.88	0.93	Nil.	0.99	0.04
29.....	2.00 <i>a</i>	23.00	1.22	1.68	0.93	"	0.95	Nil.
30.....	2.40	42.00	1.19	1.29	0.91	"	0.94	"
31.....	2.10 <i>a</i>	29.00			0.90	"		

a Rod out; gauge heights interpolated.

DAILY GAUGE HEIGHT AND DISCHARGE of Bullshead Creek at Clark's Ranch, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	0.95	Nil.
2.....	"	"	"	"	"	"	0.95	"
3.....	0.93	"	"	"	"	"	1.07	0.30
4.....	Dry.	"	"	"	"	"	1.14	0.77
5.....	"	"	"	"	"	"	1.19	1.29
6.....	"	"	"	"	"	"	1.19	1.29
7.....	"	"	"	"	"	"	1.41	5.30
8.....	"	"	"	"	"	"	1.87	20.00
9.....	"	"	"	"	"	"	1.89	21.00
10.....	"	"	"	"	"	"	1.99	25.00
11.....	"	"	"	"	"	"	1.45	6.30
12.....	"	"	"	"	"	"	1.41	5.30
13.....	"	"	"	"	1.14	0.77	1.38	4.70
14.....	"	"	"	"	1.28	2.60	1.35	4.00
15.....	"	"	"	"	1.30	3.00	1.27	2.50
16.....	"	"	"	"	"	"	"	"
17.....	"	"	"	"	1.18	1.18	1.24	1.96
18.....	"	"	"	"	1.12	0.61	1.24	1.96
19.....	"	"	"	"	1.04	0.17	1.24	1.96
20.....	"	"	"	"	1.03	0.14	1.24	1.96
21.....	"	"	"	"	1.00	0.05	1.24	1.96
22.....	"	"	0.54	"	0.98	0.03	1.24	1.96
23.....	"	"	Dry.	"	0.98	0.03	1.22	1.68
24.....	"	"	"	"	0.96	0.01	1.19	1.29
25.....	"	"	"	"	0.95	Nil.	1.19	1.29
26.....	"	"	"	"	0.95	"	1.17	1.07
27.....	"	"	"	"	0.95	"	1.12	0.61
28.....	"	"	"	"	0.95	"	1.12	0.61
29.....	"	"	"	"	0.95	"	1.11	0.53
30.....	"	"	"	"	0.95	"	1.09	0.40
31.....	"	"	"	"	"	"	1.09	0.40

MONTHLY DISCHARGE of Bullshead Creek at Clark's Ranch, for 1914.

(Drainage area 56 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (17-31).....	42.00	5.60	15.40	0.275	0.150	457
April.....	34.00	1.29	11.10	0.198	0.220	660
May.....	6.10	0.00	1.16	0.021	0.020	71
June.....	1.07	0.00	0.21	0.004	0.004	13
July.....	"	"	"	"	"	Nil.
August.....	"	"	"	"	"	"
September.....	3.00	0.00	0.29	0.005	0.006	17
October.....	25.00	0.00	3.80	0.068	0.080	234
The period.....					0.480	1,452

SESSIONAL PAPER No. 25c

STARK AND BURTON DITCH FROM BULLSHEAD CREEK.

Location.—On the SE. $\frac{1}{4}$ Sec. 17, Tp. 11, Rge. 5, W. 4th Mer., at Stark and Burton's ranch near Medicine Hat.

Records available.—As sufficient discharge measurements have not been made to complete the discharge of this ditch, only estimates are available for the years of 1912-14.

Gauge.—Vertical staff; the zero of the gauge has been maintained at 97.87 feet since establishment.

Bench-mark.—The head of a nail in a five-inch post, six feet upstream from the gauge; assumed elevation, 100.00 feet.

Channel.—Composed of sand and gravel.

Discharge measurements.—Made with a meter by wading.

Observer.—R. E. Stark.

Remarks.—During September, 1914, Mr. Stark increased the width of this ditch, which has changed the cross-section at the station. The ditch was used for about 24 days in April (April 7-30), but as no discharge measurements were made there are not sufficient data to estimate the daily discharge.

BULLSHEAD CREEK NEAR DUNMORE.

Location.—On SW. $\frac{1}{4}$ Sec. 16, Tp. 12, Rge. 5, W. 4th Mer., at the traffic bridge about four miles east of Medicine Hat and about one mile above the junction of Ross and Bullshead Creeks.

Records available.—July 26, 1909, to October 31, 1914.

Gauge.—Staff; elevation of zero of gauge 2,295.65 feet during 1909-11; 2,295.01 feet during 1912; 2,295.06 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; elevation, 2,305.53 feet above mean sea level (Geodetic Survey).

Channel.—Shifting.

Discharge measurements.—From bridge, by wading, or with weir.

Gauge heights.—Owing to it being impossible to obtain an observer, no records were obtained during 1914.

Winter flow.—Observations discontinued during winter.

DISCHARGE MEASUREMENTS of Bullshead Creek near Dunmore, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 16.....	R. J. Srigley.....	20.0	20.4	1.42	1.95	28.00
Mar. 26.....	do.....	16.0	9.5	1.40	1.35	12.90
April 3.....	do.....	35.0	34.6	1.50	2.19	52.00
May 14.....	H. S. Kerby.....					0.02 ^a
June 10.....	do.....					Nil.
June 30.....	do.....					"
July 31.....	do.....					"
Oct. 12.....	do.....	17.0	13.3	1.17	1.76	15.60

^a Weir measurement.

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Ross Creek drainage basin, in 1914.

Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
July 6.....	H. W. Rowley....	Elkwater Creek	$\frac{1}{4}$ mile above Elkwater Lake.....				0.39

SEVENPERSONS RIVER DRAINAGE BASIN.

General Description.

Sevenpersons River lies between the South Saskatchewan River and the Cypress Hills, and empties into the South Saskatchewan River at Medicine Hat. The drainage area consists mostly of open, level prairie, which has a small rainfall and a run-off confined chiefly to the spring freshet.

The creek has a considerable flow during the month of April, but the discharge decreases to nil about June.

There are no irrigation works of importance on this stream, and the records are valuable chiefly for statistical purposes.

SEVENPERSONS RIVER AT MEDICINE HAT.

Location.—On NE. $\frac{1}{4}$ Sec. 30, Tp. 12, Rgc. 5, W. 4th Mer., at the bridge on the road between Medicine Hat and Dunmore and about one and one-half miles east of the Canadian Pacific Railway station at Medicine Hat.

Records available.—April 27, 1910, to October 31, 1914.

Gauge.—Staff; elevation of zero of gauge 86.68 feet, unchanged since establishment.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Shifting.

Discharge measurements.—From bridge, by wading, or with weir.

Winter flow.—Observations discontinued during the winter.

Observer.—J. W. Pickering.

DISCHARGE MEASUREMENTS of Sevenpersons River at Medicine Hat, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 16.....	R. J. Srigley.....	5.0	1.60	0.98	2.94	1.56
Mar. 25.....	do.....	5.0	1.70	0.93	2.94	1.58
April 3.....	do.....	15.5	14.90	2.26	2.91	33.80
April 8.....	do.....	44.0	58.80	2.17	3.26	128.00
May 14.....	H. S. Kerby.....	<i>a</i>			1.72	0.40
June 10.....	do.....				Dry.	Nil.
June 30.....	do.....				"	"
July 31.....	do.....				"	"
Oct. 12.....	do.....				"	"

a Weir measurement.

MONTHLY DISCHARGE of Sevenpersons River at Medicine Hat, for 1912-13.

(Drainage area 797 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
1912.						
July (21-31).....	10.8	Nil.	2.07	0.003	0.001	45
August.....	7.9	a	1.41	0.002	0.002	86
September.....	4.5		1.37	0.002	0.002	82
October.....	2.0	0.42	1.13	0.001	0.001	69
November (1-15).....	1.0	1.00	1.00	0.001	0.001	30
The period.....					0.007	312
1913.						
April (3-30).....	400.00	7.90	155.20	0.194	0.20	8,619
May.....	11.20	0.05	5.11	0.006	0.01	314
June.....	2.60	0.00	0.32	0.000	0.00	19
July (1-12).....	0.38	0.00	0.09	0.000	0.00	2
August a.....						
September a.....						
October (5-31).....	0.10	0.07	0.08	0.000	0.00	4
The period.....					0.21	8,958

a No observations in these months.

NOTE.—These tables are inserted in this report to correct tables which were published in the reports for 1912 and 1913. The drainage area used for those years was in error.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Sevenpersons River at Medicine Hat, for 1914.

DAY.	March.		April.		May.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.65	13.5	1.79	2.30
2.....			2.87	29.0	1.77	1.85
3.....			2.90	34.0	1.75	1.42
4.....			3.21	77.0	1.75	1.42
5.....			3.29	102.0	1.76	1.64
6.....			3.10	86.0	1.75	1.42
7.....			3.10	94.0	1.75	1.42
8.....			3.17	110.0	1.73	1.03
9.....			3.11	102.0	1.73	1.03
10.....			2.99	83.0	1.73a	1.03
11.....			2.69	50.0	1.72a	0.78
12.....			2.39	27.0	1.72a	0.78
13.....			2.34	24.0	1.71a	0.56
14.....			2.29	21.0	1.71a	0.56
15.....			2.24	19.0	1.70a	0.35
16.....	3.00	3.5	2.27	20.0	1.70a	0.35
17.....	2.99	3.2	2.27	20.0	1.69	0.32
18.....	2.98	3.0	2.31	23.0	1.67	0.24
19.....	2.97	2.8	2.29	21.0	1.63	0.10
20.....	2.97	2.8	2.23	18.0	1.49	Nil.b
21.....	2.94	2.2	2.18	16.1	1.49	"
22.....	2.94a	2.2	2.07	10.9	1.49	"
23.....	2.94a	2.2	2.00	8.5	1.49	"
24.....	2.93a	2.0	1.97	7.4	1.48	"
25.....	2.93a	2.0	1.91	5.3	1.45	"
26.....	2.82a	2.7	1.87	4.2	1.44	"
27.....	2.77a	4.5	1.85	3.7	1.42	"
28.....	2.62a	3.5	1.84	3.5	1.40	"
29.....	2.47	1.5	1.83	3.2	1.40	"
30.....	2.32	4.5	1.81	2.7	1.40	"
31.....	2.39	9.0			1.40	"

a Gauge height interpolated.

b River dry from May 20.

MONTHLY DISCHARGE of Sevenpersons River at Medicine Hat, for 1914.

(Drainage area 797 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
March (16-31).....	9.0	1.5	3.20	0.004	0.002	101
April.....	110.0	2.7	35.00	0.044	0.049	2,082
May.....	2.3	Nil.	0.63	0.002	0.002	37
June.....						Nil.
July.....						"
August.....						"
September.....						"
October.....						"
The period.....					0.053	2,220

LAKE JOHNSTON DRAINAGE BASIN.

General Description.

Lake Johnston lies about 20 miles southwest of the city of Moosejaw. It is about 25 miles long and 15 wide, and covers an area of nearly five townships. Almost all the drainage into the lake comes from the south and west through Wood River. The main tributaries of Wood River are Wiwa Creek, Notukeu Creek, Pinto Creek and Wood Creek. These drain a large area, but, owing to the limited rainfall and the small slope of the drainage basin, the run-off is comparatively small.

Lake Johnston has no surface outlet, and there has been no surface flow from Lake Chaplin to Lake Johnston for several years, but it is noted that the elevations of the two lakes are the same. There is often considerable flow in Wood River in the spring, and there is always some discharge at all seasons; nevertheless, the lake has during recent years receded.

The lower part of Wood River has a very small fall, and is more of the nature of a long slough than that of a running stream. The channel is from twenty to fifty feet wide, and is from two to five feet deep. The bottom is composed of soft clay, and is covered with weeds and grass. There is so little fall that it would be impossible to take out water by gravity, and a dam would flood a large area of good agricultural land. There is, therefore, little possibility of irrigation development in this basin.

This drainage basin includes a large area of very good agricultural land. This is pretty well taken up by settlers and is being farmed with good results. There is one irrigation scheme on Pearce Creek.

NOTUKFU CREEK NEAR VANGUARD.

Location.—On NW. $\frac{1}{4}$ Sec. 10, Tp. 11, Rge. 10, W. 3rd Mer., at the traffic bridge south of the town.

Records available.—August 6, 1914, to December 31, 1914.

Gauge.—Staff; zero elevation of gauge was maintained at 77.94 feet during 1914.

Bench-mark.—Top of large bolt on plate, top of left pier downstream side; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From traffic bridge during high water, or by wading.

Winter flow.—Affected by ice.

Observer.—Miss Ripley.

DISCHARGE MEASUREMENTS of Notukeu Creek near Vanguard, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Aug. 6	W. H. Storey					<i>a</i>
Sept. 5	do	26	10.0	0.19	1.27	1.87
Dec. 1	J. E. Caughey	26	16.0	0.29	1.53	4.62
Dec. 22	do	21	3.4	0.12	1.38	0.42

a Water in pools; no flow.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Notukeu Creek near Vanguard, for 1914.

DAY.	August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			1.41	3.20	1.26	1.82	1.44	3.5	1.52	4.60 ^a
2.....			1.40	3.10	1.27	1.89	1.40	3.1	1.52	4.50
3.....			1.37	2.80	1.33	2.40	1.40	3.1	1.52	4.30
4.....			1.31	2.20	1.36	2.70	1.38	2.9	1.52	4.10
5.....			1.27	1.89	1.40	3.10	1.38	2.9	1.52	3.80
6.....	Dry.	Nil.	1.26	1.82	1.43	3.40	1.38	2.9	1.52	3.40
7.....	"	"	1.26	1.82	1.48	4.00	1.40	3.1	1.50	3.10
8.....	"	"	1.26	1.82	1.53	4.60	1.40	3.1	1.50	2.70
9.....	"	"	1.23	1.61	1.59	5.30	1.41	3.2	1.50	2.40
10.....	"	"	1.20	1.40	1.62	5.70	1.42	3.3	1.52	2.00
11.....	"	"	1.19	1.35	1.62	5.70	1.42	3.3	1.52	1.70
12.....	"	"	1.20	1.40	1.60	5.40	1.42	3.3	1.52	1.35
13.....	"	"	1.16	1.20	1.55	4.80	1.42	3.3	1.52	1.00
14.....	"	"	1.28	1.96	1.54	4.70	1.43	3.4	1.53	0.80
15.....	"	"	1.38	2.90	1.57	5.00	1.41	3.2	1.53	0.70
16.....	"	"	1.44	3.50	1.61	5.50	1.41	3.2	1.53	0.62
17.....	"	"	1.40	3.10	1.63	5.80	1.41	3.2	1.53	0.57
18.....	"	"	1.38	2.90	1.61	5.50	1.39	3.0	1.53	0.54
19.....	"	"	1.34	2.50	1.58	5.20	1.39	3.0	1.55	0.48
20.....	"	"	1.31	2.20	1.55	4.80	1.37	2.8	1.55	0.45
21.....	"	"	1.31	2.20	1.53	4.60	1.37	2.8	1.53	0.44
22.....	1.19	1.35	1.29	2.00	1.51	4.30	1.36	2.7	1.38	0.42
23.....	1.53	4.60	1.27	1.89	1.51	4.30	1.35	2.6	1.38	0.37
24.....	1.84	8.50	1.27	1.89	1.50	4.20	1.35	2.6	1.38	0.33
25.....	2.01	10.70	1.28	1.96	1.49	4.10	1.34	2.5	1.37	0.28
26.....	1.93	9.70	1.28	1.96	1.48	4.00	1.33	2.4	1.37	0.21
27.....	1.80	8.00	1.28	1.96	1.47	3.90	1.36	2.7	1.37	0.20
28.....	1.65	6.00	1.27	1.89	1.47	3.90	1.38	2.9	1.35	0.15
29.....	1.55	4.80	1.26	1.82	1.47	3.90	1.39	3.0	1.35	0.10
30.....	1.48	4.00	1.25	1.75	1.46	3.80	1.42	3.3	1.36	0.05
31.....	1.41	3.20			1.46	3.80			1.36	0.01 ^a

^a Ice conditions Dec. 1 to 31.

MONTHLY DISCHARGE of Notukeu Creek near Vanguard, for 1914.

(Drainage area 1,406 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
August.....	10.7	Nil.	2.30	0.0016	0.002	119
September.....	3.5	1.20	2.10	0.0014	0.002	125
October.....	5.8	1.82	4.30	0.0030	0.003	264
November.....	3.5	2.40	3.00	0.0021	0.002	178
December.....	4.6	0.01	1.48	0.0010	0.001	91
The period.....					0.010	777

QU'APPELLE RIVER DRAINAGE BASIN.

General Description.

Qu'Appelle River rises in Township 23, Range 4, West of the 3rd Meridian, and flows eastward into the Assiniboine River in Township 28, Range 17, West of the Principal Meridian. These waters eventually find their way into Hudson's Bay through the Red River, Lake Winnipeg and Nelson River.

The chief tributaries of Qu'Appelle River are Moosejaw Creek, Last Mountain Lake, Waskana Creek and Loon Creek. Last Mountain is the largest lake in the basin, being some sixty miles long and from one to three miles wide.

The valley of the main stream is from 200 to 300 feet deep, with a flat from one to three miles wide along the river. This flat is covered in many places with brush, and the side hills are in many places well wooded. The bench lands above the river are mostly level prairie, much of which is now under cultivation.

The mean annual rainfall at Moosejaw is 14 inches; at Regina, 15 inches; and at Indian Head, 19 inches. The streams are frozen during the winter months, and there is usually an abundant snowfall.

There are several irrigation and many industrial water rights in this basin.

QU'APPELLE RIVER AT LUMSDEN.

Location.—On NW. $\frac{1}{4}$ Sec. 33, Tp. 19, Rge. 21, W. 2nd Mer., at farm near Lumsden, Sask. Records available.—May 12, 1911, to December 31, 1914.

Gauge.—Vertical staff; zero of gauge maintained at 85.33 feet during 1911-13; and at 85.16 feet during 1914.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge or by wading.

Winter flow.—Affected by ice.

Observer.—J. G. Miller.

DISCHARGE MEASUREMENTS of Qu'Appelle River at Lumsden, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 14	F. R. Steinberger	13.5	7.16	0.075	2.56	0.54
Feb. 3	do	13.0	8.90	0.000	2.60	0.00
Feb. 21	do	10.9	5.10	0.000	2.54	0.00
Mar. 12	do	10.5	7.90	0.180	2.55	1.43
April 7	do	27.0	77.00	1.000	5.81	77.10
May 18	W. H. Storey	27.0	116.00	0.220	3.11	25.60
July 4	do	27.0	114.00	0.180	3.02	20.60
July 16	do	27.0	123.00	.....	3.29	.....^a
Aug. 11	do	24.0	20.70	0.210	2.34	4.34
Oct. 8	F. R. Steinberger	24.0	24.60	0.350	2.50	8.56
Nov. 19	do	18.0	10.20	0.281	2.16	2.90
Dec. 9	do	15.5	9.80	0.390	2.31	3.82

^a Measurement could not be made, due to low velocity.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE OF Qu'Appelle River at Lumsden, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.83	2.70 ^c	2.86	0.06	2.54	0.09	4.38	7.5	3.33	34.0	3.00	22.0
2.....	2.83	2.67	2.79	0.01	2.56	0.14	5.40	10.4	3.26	31.0	3.00	22.0
3.....	2.78	2.61	2.74	Nil.	2.56	0.22	5.06	13.0	3.18	28.0	3.02	22.0
4.....	2.77	2.53	2.74	"	2.62	0.30	5.88	15.7	3.33	34.0	2.82	15.6
5.....	2.77	2.44	2.74	"	2.62	0.40	6.22	26.0 ^a	3.93	65.0	2.97	20.0
6.....	2.78	2.33	2.72	"	2.61	0.50	6.04	38.0	3.90	63.0	3.06	24.0
7.....	2.86	2.23	2.70	"	2.61	0.64	5.93	56.0	3.89	62.0	3.20	29.0
8.....	2.83	2.08	2.70	"	2.55	0.77	5.64	69.0	3.60	47.0	3.32	34.0
9.....	2.83	1.87	2.65	"	2.56	0.94	5.52	84.0	3.49	42.0	3.41	38.0
10.....	2.84	1.65	2.65	"	2.58	1.09	5.89	98.0	3.40	37.0	3.25	31.0
11.....	2.86	1.44	2.68	"	2.54	1.28	7.88	112.0	3.36	35.0	3.10	25.0
12.....	2.87	1.45	2.67	"	2.59	1.43	7.69	116.0	3.32	34.0	3.01	22.0
13.....	2.85	1.50	2.69	"	2.84	1.75	7.72	132.0	3.31	33.0	3.00	22.0
14.....	2.84	1.30	2.71	"	2.95	2.10	7.85	150.0	3.06	24.0	3.04	23.0
15.....	2.86	1.00	2.69	"	4.22	2.50	6.77	160.0	2.83	15.9	3.05	23.0
16.....	2.88	0.75	2.66	"	4.64	2.90	6.24	175.0 ^{ac}	2.84	16.2	3.06	24.0
17.....	2.82	0.54	2.69	"	4.35	3.00	5.97	187.0	3.21	29.0	3.02	22.0
18.....	2.77	0.48	2.67	"	4.86	2.95	5.75	174.0	3.11	25.0	3.06	24.0
19.....	2.81	0.40	2.65	"	4.61	2.90	5.21	142.0	3.19	29.0	3.08	24.0
20.....	2.85	0.32	2.63	"	4.28	2.82	5.01	130.0	3.22	30.0	3.08	24.0
21.....	2.83	0.27	2.65	"	4.12	2.77	4.86	121.0	3.15	27.0	2.90	18.0
22.....	2.77	0.23	2.63	"	3.75	2.70	4.67	109.0	3.14	27.0	2.98	21.0
23.....	2.77	0.22	2.63	"	3.64	2.60	4.24	83.0	3.11	25.0	3.10	25.0
24.....	2.82	0.24	2.58	"	3.54	2.50	3.95	66.0	3.06	24.0	3.12	26.0
25.....	2.85	0.27	2.54	"	3.34	2.42	3.90	63.0	3.12	26.0	2.88	17.4
26.....	2.81	0.32	2.53	"	3.05	2.32	3.81	58.0	3.29	33.0	2.86	16.8
27.....	2.82	0.40	2.53	"	2.96	2.22	3.73	54.0	3.12	26.0	2.94	19.4
28.....	2.82	0.45	2.53	0.02	2.91	2.16	3.65	50.0	3.26	31.0	3.08	24.0
29.....	2.79	0.41	.....	.....	2.84	2.24	3.53	44.0	3.30	33.0	3.10	25.0
30.....	2.80	0.27	.....	.....	3.08	2.40	3.43	38.0	3.39	37.0	3.03	23.0
31.....	2.86	0.15	.....	.....	3.78	4.30	.....	.....	3.15	27.0	.....	.....

^a to ^a Estimated.^c Ice conditions Jan. 1 to April 16.

DAILY GAUGE HEIGHT AND DISCHARGE of Qu'Appelle River at Lumsden, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	2.98	22.0	2.70	12.5	2.61	10.2	2.32	4.8	2.31	4.6	2.45	4.40
2.....	3.00	22.0	2.70	12.5	2.51	8.2	2.36	5.4	2.33	5.0	2.41	4.00
3.....	3.02	22.0	2.70	12.5	2.49	7.8	2.35	5.2	2.35	5.2	2.36	4.30
4.....	3.02	22.0	2.66	11.5	2.36	5.4	2.39	5.8	2.36	5.4	2.34	4.10
5.....	3.01	22.0	2.60	10.0	2.29	4.4	2.44	6.8	2.36	5.4	2.32	4.00
6.....	3.20	29.0	2.68	12.0	2.34	5.1	2.48	7.6	2.31	4.6	2.32	4.00
7.....	2.88	17.4	2.62	10.5	2.33	5.0	2.44	6.8	2.30	4.5	2.33	4.10
8.....	2.92	18.7	2.61	10.2	2.30	4.5	2.50	8.0	2.32	4.8	2.33	4.00
9.....	2.98	21.0	2.59	9.8	2.48	7.6	2.58	9.6	2.34	5.1	2.33	3.80
10.....	2.99	21.0	2.51	8.2	2.95	19.6	2.66	11.5	2.31	4.6	2.30	3.90
11.....	3.09	25.0	2.39	5.8	2.36	5.4	2.53	8.6	2.33	5.0	2.29	3.00
12.....	3.04	23.0	2.48	7.0	2.32	4.8	2.45	7.0	2.31	4.6	2.27	2.00
13.....	2.95	19.8	2.42	6.4	2.30	4.5	2.42	6.4	2.30	4.5	2.27	2.30
14.....	2.98	21.0	2.34	5.1	2.26	3.9	2.40	6.0	2.30	4.5	2.27	2.20
15.....	3.14	27.0	2.17	2.6	2.19	2.8	2.38	5.7	2.29	3.3 ^a	2.25	1.66
16.....	3.36	35.0	2.42	6.4	2.47	7.4	2.35	5.2	2.26	3.1	2.25	1.30
17.....	3.14	27.0	2.45	7.0	2.25	3.8	2.35	9.2	2.20	3.2	2.20	1.65
18.....	2.90	18.0	2.44	6.8	2.25	3.8	2.35	5.2	2.18	3.3	2.18	2.60
19.....	2.76	14.0	2.38	5.7	2.24	3.6	2.35	5.2	2.16	2.9	2.18	2.20
20.....	2.92	18.7	2.47	7.4	2.27	4.0	2.32	4.8	2.14	3.5	2.15	1.78
21.....	2.99	21.0	2.42	6.4	2.32	4.8	2.30	4.5	2.14	4.3	2.15	1.76
22.....	2.90	18.0	2.42	6.4	2.31	4.6	2.32	4.8	2.13	4.3	2.14	1.48
23.....	2.86	16.8	2.37	5.6	2.28	4.2	2.38	5.7	2.15	4.0	2.14	0.77
24.....	2.85	16.5	2.38	5.7	2.28	4.2	2.31	4.6	2.16	4.3	2.12	0.91
25.....	2.81	15.3	2.32	4.8	2.26	3.9	2.32	4.8	2.18	4.4	2.10	1.02
26.....	2.78	14.5	2.26	3.9	2.25	3.8	2.34	5.1	2.20	4.6	2.05	1.08
27.....	2.76	14.0	2.32	4.8	2.26	3.9	2.32	4.8	2.23	4.8	1.95	0.95
28.....	2.74	13.5	2.34	5.1	2.25	3.8	2.30	4.5	2.27	4.3	2.02	0.95
29.....	2.71	12.8	2.39	5.8	2.25	3.8	2.33	5.0	2.25	4.6	1.94	0.99
30.....	2.70	12.5	2.42	6.4	2.27	4.0	2.35	5.2	2.37	4.6	1.95	1.04
31.....	2.70	12.5	2.54	8.8	.....	.....	2.32	4.8	.....	.....	1.95	1.05 ^a

^a Ice conditions Nov. 15 to Dec. 31.

MONTHLY DISCHARGE of Qu'Appelle River at Lumsden, for 1914.

(Drainage area 6,160 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	2.70	0.15	1.140	0.000200	0.0002	70
February.....	0.06	0.02	0.007	0.000001	0.0000	0
March.....	4.30	0.09	1.850	0.000300	0.0003	114
April.....	187.00	7.50	86.000	0.014000	0.0160	5,117
May.....	65.00	15.90	33.000	0.005400	0.0060	2,029
June.....	38.00	15.60	24.000	0.003900	0.0040	1,428
July.....	35.00	12.50	19.800	0.003200	0.0040	1,218
August.....	12.50	2.60	7.500	0.001200	0.0010	461
September.....	19.60	2.80	5.400	0.000900	0.0010	321
October.....	11.50	4.50	6.000	0.001000	0.0010	369
November.....	5.40	2.90	4.400	0.000700	0.0008	262
December.....	4.40	0.77	2.400	0.000400	0.0005	148
The year.....	.....	.....	.....	.....	0.0348	11,537

MOOSEJAW CREEK DRAINAGE BASIN.

General Description.

Moosejaw Creek rises in the Yellowgrass Marsh, which lies in Townships 9 and 10, Range 17, West of the 2nd Meridian, and flows in a north and westerly direction until it reaches the city of Moosejaw, where it is joined by Thunder Creek. From Moosejaw it follows an easterly and northerly course, finally emptying into the Qu'Appelle River near Buffalo Pound Lake. From the headwaters to the city of Moosejaw the drainage area is estimated at about 1,830 square miles. This area is almost entirely devoid of tree growth, except in the vicinity of Moosejaw, where the valley is lined with brush.

Throughout its entire length the creek flows in a very crooked but well-defined channel. The upper portion of the valley is small, being merely a depression, but it gradually increases in size until at Drinkwater it is about 30 feet deep and at Moosejaw about 80 feet deep. The fall in the creek is very small, and particularly so between Drinkwater and Moosejaw, where the total fall is only 67.5 feet, or an average of 2.3 feet per mile of valley.

The Canadian Pacific Railway Company has dams at Milestone, Rouleau, Drinkwater, two at Moosejaw and one at Pasqua. There is also a municipality dam in Section 19, Township 15, Range 24, West of the 2nd Meridian, which supplies water to the neighbourhood during periods when there is no flow in the creek. In 1913 the Canadian Pacific Railway Company constructed a new dam to replace their present dam in Moosejaw.

MOOSEJAW CREEK NEAR LANG.

Location.—At traffic bridge on road allowance east of the NE. $\frac{1}{4}$ Sec. 24, Tp. 11, Rge. 19, W. 2nd Mer., four miles west of the village of Lang.

Records available.—From June 21, 1911, to October 31, 1914.

Gauge.—Vertical staff; zero of gauge was maintained at 94.80 feet during 1911; 95.07 feet during 1912-13; 95.04 feet during 1914.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge or by wading.

Winter flow.—No winter observations have been taken.

Observer.—Miss Irene Irvine.

DISCHARGE MEASUREMENTS of Moosejaw Creek near Lang, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 20.....	F. R. Steinberger.....	14	10.8	0.260	2.41	2.820
May 10.....	W. H. Storey.....	20	10.0	0.343	1.55	3.430
June 16.....	do.....	15	3.9	0.210	0.89	0.802
July 10.....	do.....	.....	.....	.....	Dry.	Nil.
July 27.....	do.....	.....	.....	.....	"	"
Aug. 28.....	do.....	.....	.....	.....	"	"

DAILY GAUGE HEIGHT AND DISCHARGE of Moosejaw Creek near Lang, for 1914.

DAY.	March.		April.		May.		June.		July.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			3.25	51.0	1.74	5.80	0.95	0.92	0.49	0.53
2.....			3.40	56.0	1.72	5.40	0.88	0.83	0.44	0.51
3.....			3.19	50.0	1.66	4.60	1.06	1.13	0.38	0.48
4.....			3.14	47.0	1.71	5.30	1.07	1.15	0.29	0.44
5.....			3.41	56.0	1.72	5.40	1.09	1.20	0.24	0.42
6.....			3.34	54.0	1.72	5.40	1.06	1.13	0.19	0.40
7.....			3.29	52.0	1.60	3.90	1.05	1.11	0.14	0.38
8.....			3.22	50.0	1.58	3.70	1.04	1.09	0.09	0.36
9.....			3.03	44.0	1.56	3.50	0.99	0.98	.....^b	.....
10.....			2.93	41.0	1.61	4.00	0.96	0.94	.....	.....
11.....			2.78	36.0	1.59	3.80	0.94	0.91	.....	.....
12.....			2.92	41.0	1.56	3.50	0.92	0.88	.....	.....
13.....			2.72	35.0	1.54	3.40	0.89	0.84	.....	.....
14.....			2.92	41.0	1.51	3.10	0.88	0.83	.....	.....
15.....	1.50		2.66	33.0	1.51	3.10	0.87	0.82	.....	.....
16.....	2.87		2.66	33.0	1.50	3.00	0.84	0.79	.....	.....
17.....	2.95		2.56	29.0	1.50	3.00	0.81	0.76	.....	.....
18.....	2.85		2.41	25.0	1.50	3.00	0.77	0.73	.....	.....
19.....	2.82		2.30	22.0	1.50	3.00	0.74	0.70	.....	.....
20.....	2.53		2.40	25.0	1.47	2.80	0.71	0.68	.....	.....
21.....	2.38		2.19	18.1	1.44	2.60	0.69	0.66	.....	.....
22.....	2.26		2.15	16.9	1.41	2.50	0.64	0.63	.....	.....
23.....	2.25		2.09	15.0	1.36	2.20	0.59	0.59	.....	.....
24.....	2.25		2.00	12.2	1.31	1.95	0.55	0.57	.....	.....
25.....	2.22		1.94	10.3	1.27	1.80	0.51	0.55	.....	.....
26.....	2.22		1.88	8.6	1.22	1.59	0.49	0.53	.....	.....
27.....	2.21		1.85	7.9	1.15	1.37	0.51	0.55	.....	.....
28.....	2.21		1.83	7.5	1.10	1.22	0.54	0.56	.....	.....
29.....	2.21		1.80	6.8	1.05	1.11	0.59	0.59	.....	.....
30.....	2.96a		1.77	6.3	1.01	1.02	0.54	0.56	.....	.....
31.....	3.05		.....	.....	0.99	0.98	.....	.....	.....	.....

a Creek clear of ice March 31 to April 24, estimated.
 b Creek dry after July 8.

MONTHLY DISCHARGE of Moosejaw Creek near Lang, for 1914.

(Drainage area 189 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	56.00	6.30	31.00	0.1640	0.1830	1,845
May.....	5.80	0.98	3.10	0.0164	0.0189	191
June.....	1.20	0.53	0.80	0.0042	0.0047	48
July.....	0.53	0.36	0.44	0.0023	0.0007	7
The period.....	0.2073	2,091

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MOOSEJAW CREEK AT MCCARTHY'S FARM.

Location.—On the NW. $\frac{1}{4}$ Sec. 16, Tp. 16, Rge. 26, W. 2nd Mer., about three miles south of Moosejaw.

Records available.—April 7, 1910, to December 31, 1914.

Gauge.—Vertical staff; elevation of zero was maintained at 83.93 feet during 1910-11; 82.99 feet during 1912-13; 81.99 feet during 1914.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge or by wading.

Winter flow.—Affected by ice.

Observer.—V. J. McCarthy.

DISCHARGE MEASUREMENTS of Moosejaw Creek at McCarthy's Farm, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Jan. 15.	F. R. Steinberger.				1.20	Nil.
Feb. 5.	do				1.02	"
Feb. 23.	do				0.95	"
Mar. 13.	do				1.66	"
April 4.	do	36.9	49.80	0.57	2.64	28.00
May 8.	W. H. Storey.	23.0	6.00	0.80	1.67	4.80
June 10.	do	20.0	4.70	1.15	1.65	5.40
July 6.	do	15.0	3.40	0.25	1.45	0.85
Aug. 1.	do				Dry.	Nil.
Aug. 27.	do				"	"
Oct. 7.	F. R. Steinberger.				"	"
Nov. 18.	do				"	"
Dec. 5.	do	10.5	3.23	0.31	1.31	1.00
Dec. 28.	do				1.10	Nil.

DAILY GAUGE HEIGHT AND DISCHARGE of Moosejaw Creek at McCarthy's Farm, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.	1.10	Nil. ^a	1.00	Nil.	1.10	Nil.	2.90	19.0	1.89	13.60	1.51	1.52
2.	1.02	"	1.00	"	1.40	"	2.78	25.0	1.87	12.80	1.50	1.30
3.	1.10	"	1.01	"	1.49	"	2.90	28.0	1.84	11.60	1.51	1.52
4.	1.05	"	1.00	"	1.65	"	2.86	30.0	1.83	11.20	1.63	4.40
5.	1.33	"	1.00	"	1.65	"	2.62	41.0	1.79	9.60	1.61	3.80
6.	1.32	"	0.98	"	1.62	"	2.58	54.0	1.75	8.20	1.63	4.40
7.	1.25	"	0.97	"	1.64	"	2.71	67.0	1.75	8.20	1.74	7.90
8.	1.30	"	0.95	"	1.68	"	2.88	81.0	1.71	6.90	1.78	9.30
9.	1.31	"	0.92	"	1.55	"	3.34	145.0	1.71	6.90	1.73	7.60
10.	1.29	"	0.93	"	1.40	"	4.02	198.0 ^b	1.73	7.60	1.66	5.30
11.	1.28	"	0.90	"	1.70	"	3.87	182.0	1.78	9.30	1.63	4.40
12.	1.22	"	0.89	"	1.75	"	3.57	149.0	1.73	7.60	1.60	3.50
13.	1.25	"	0.80	"	1.65	"	3.41	138.0	1.71	6.90	1.59	3.30
14.	1.20	"	0.75	"	1.75	"	3.30	121.0	1.67	5.60	1.56	2.60
15.	1.20	"	0.74	"	1.85	"	3.21	112.0	1.63	4.40	1.55	2.40
16.	1.23	"	1.01	"	1.85	"	3.07	98.0	1.62	4.10	1.55	2.40
17.	1.23	"	0.90	"	1.75	"	2.91	84.0	1.61	3.80	1.53	2.00
18.	1.23	"	0.85	"	1.62	"	2.71	67.0	1.61	3.80	1.52	1.74
19.	1.22	"	0.85	"	1.65	"	2.53	52.0	1.63	4.40	1.52	1.74
20.	1.21	"	0.85	"	1.65	"	2.41	44.0	1.61	3.80	1.54	2.20
21.	1.20	"	0.83	"	1.92	"	2.37	41.0	1.59	3.30	1.57	2.84
22.	1.20	"	0.70	"	1.90	"	2.23	33.0	1.57	2.84	1.56	2.60
23.	1.20	"	0.67	"	1.85	"	2.23	33.0	1.57	2.84	1.51	1.52
24.	1.20	"	0.85	"	1.70	"	2.19	30.0	1.55	2.40	1.50	1.30
25.	1.25	"	0.95	"	1.66	"	2.11	26.0	1.53	2.00	1.50	1.30
26.	1.10	"	0.95	"	1.66	"	2.02	20.0	1.51	1.52	1.54	2.20
27.	1.05	"	1.40	"	1.67	"	1.89	13.6	1.51	1.52	1.57	2.84
28.	1.08	"	1.10	"	1.68	" ^a	1.81	10.4	1.51	1.52	1.64	4.70
29.	1.10	"			3.20	8 ^b	1.91	14.5	1.53	2.00	1.65	5.00
30.	1.08	"			3.00	11	1.92	15.0	1.55	2.40	1.60	3.50
31.	1.05	"			2.85	15			1.53	2.00		

^a Ice conditions Jan. 1 to March 28; no discharge.

^b March 29 to April 10, ice break-up; discharge estimated.

DAILY GAUGE HEIGHT AND DISCHARGE of Moosejaw Creek near McCarthy's Farm, for 1914.
—Concluded.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.54	1.39	1.11	0.01	Dry.	Nil.	Dry.	Nil.	Dry.	Nil.	1.39	0.45
2.....	1.51	1.32	1.14	0.04	"	"	"	"	"	"	1.38	0.35
3.....	1.48	1.10	1.13	0.03	"	"	"	"	"	"	1.35	0.11
4.....	1.46	0.90	1.10	Nil.	"	"	"	"	"	"	1.32	0.00
5.....	1.46	0.90	Dry.	" ^a	"	"	"	"	"	"	1.43	1.00
6.....	1.44	0.70	"	"	"	"	"	"	"	"	1.42	0.85
7.....	1.44	0.70	"	"	"	"	"	"	"	"	1.42	0.85
8.....	1.44	0.70	"	"	"	"	"	"	"	"	1.42	0.85
9.....	1.42	0.50	"	"	"	"	"	"	"	"	1.42	0.85
10.....	1.42	0.50	"	"	"	"	"	"	"	"	1.40	0.57
11.....	1.42	0.50	"	"	"	"	"	"	"	"	1.39	0.45
12.....	1.42	0.50	"	"	"	"	"	"	"	"	1.39	0.45
13.....	1.41	0.40	"	"	"	"	"	"	"	"	1.38	0.35
14.....	1.41	0.40	"	"	"	"	"	"	"	"	1.38	0.35
15.....	1.40	0.30	"	"	"	"	"	"	1.33	"	1.39	0.45
16.....	1.38	0.28	"	"	"	"	"	"	1.33	"	1.39	0.45
17.....	1.36	0.26	"	"	"	"	"	"	1.32	"	1.40	0.57
18.....	1.35	0.25	"	"	"	"	"	"	1.30	"	1.40	0.57
19.....	1.34	0.24	"	"	"	"	"	"	1.31	"	1.38	0.35
20.....	1.32	0.22	"	"	"	"	"	"	1.30	"	1.37	0.25
21.....	1.31	0.21	"	"	"	"	"	"	1.30	"	1.35	0.11
22.....	1.30	0.20	"	"	"	"	"	"	1.30	"	1.34	0.06
23.....	1.28	0.18	"	"	"	"	"	"	1.30	" ^a	1.34	0.06
24.....	1.25	0.15	"	"	"	"	"	"	2.00	19.0 ^b	1.33	0.03
25.....	1.24	0.14	"	"	"	"	"	"	1.99	18.5	1.31	Nil.
26.....	1.21	0.14	"	"	"	"	"	"	1.88	13.2	1.29	"
27.....	1.20	0.10	"	"	"	"	"	"	1.72	7.2	1.29	"
28.....	1.18	0.08	"	"	"	"	"	"	1.69	6.2	1.29	"
29.....	1.14	0.04	"	"	"	"	"	"	1.69	6.2	1.28	"
30.....	1.12	0.02	"	"	"	"	"	"	1.58	3.1 ^b	1.28	"
31.....	1.12	0.02	"	"	"	"	"	"			1.27	"

^a Water in pools only from Aug. 5 to Nov. 23.^b Ice went out on Nov. 24, and commenced to re-form Nov. 30. Winter conditions from Dec. 1.

MONTHLY DISCHARGE of Moosejaw Creek at McCarthy's Farm, for 1914.

(Drainage area 1,719 square miles.)

MONTH.	DISCHARGE IN SECOND FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....						Nil.
February.....						"
March.....	111.00	0.00	9.100	0.0050	0.0056	559.
April.....	198.00	10.40	73.000	0.0420	0.0468	4,344
May.....	13.60	1.52	5.600	0.0032	0.0037	344
June.....	9.30	1.30	3.400	0.0020	0.0022	202
July.....	1.39	0.04	0.430	0.0003	0.0003	26
August.....	0.04	0.00	0.003	0.0000	0.0000	Nil.
September.....						"
October.....						"
November.....	19.00	0.00	2.400	0.0010	0.0012	146
December.....	1.00	0.00	0.340	0.0002	0.0002	21
The year.....					0.0600	5,642

SOURIS RIVER DRAINAGE BASIN.

General Description.

The source of the Souris River is in marshes near Yellow Grass, Saskatchewan. From here it flows in a southeasterly direction almost parallel to the Soo line of the Canadian Pacific Railway to Estevan. It then flows east to Oxbow, then it turns south and crosses the international boundary in Range 34, West of the Principal Meridian. After making a loop into North Dakota, it recrosses the international boundary in Range 27, West of the Principal Meridian, and flows in a northeasterly direction to Souris, Manitoba, where it turns east, and finally joins the Assiniboine River in Township 8, Range 15, West of the 1st Meridian.

The chief tributaries of Souris River are: Long Creek, which joins it near Estevan, Moose Mountain Creek near Oxbow, North and South Antler Creeks near Sourisford, and Pipestone Creek near Souris.

This stream drains a large tract of typical western plains. The rainfall will probably average very little over fifteen inches, and is usually sufficiently divided over the year to prevent excessive run-off or floods. At times when there is an unusual amount of rainfall, and in the early spring, the water drains into the streams very rapidly and causes a flood of short duration.

There are towns, villages, and farms all along the course of this stream and its tributaries which depend on it for a domestic and industrial water supply. The Canadian Pacific Railway is a large consumer. The town of Estevan is establishing a waterworks system, and there is a proposed system at Weyburn to divert water from Souris River. In North Dakota it has been proposed to divert water for irrigation purposes.

LONG CREEK NEAR ESTEVAN.

Location.—At bridge on SE. $\frac{1}{4}$ Sec. 10, Tp. 2, Rge. 8, W. 2nd Mer., $2\frac{1}{2}$ miles south of the town of Estevan.

Records available.—June 22, 1911, to December 31, 1914.

Gauge.—Staff; zero of gauge maintained at 83.87 feet during 1911-12; at 83.90 feet during 1913; at 83.87 feet from January 1, 1914, to October 28, 1914; at elevation of weir crest from October 29, 1914, to December 31, 1914.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge, by wading below bridge, or by weir.

Winter flow.—Winter observations were taken in 1913-14 by a two-foot rectangular weir.

Observer.—Geo. Pawson.

DISCHARGE MEASUREMENTS of Long Creek near Estevan, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 24.....	F. R. Steinberger.....	39.5	98.60	0.580	5.35	57.10
May 12.....	W. H. Storey.....	36.0	86.40	0.480	2.21	41.60
June 17.....	do.....	36.0	77.20	0.484	1.99	37.20
July 11.....	do.....	34.0	69.20	0.267	1.54	18.40
July 28.....	do.....	6.6	2.42	0.880	0.79	2.16
Aug. 29.....	do.....	6.0	2.30	1.170	1.13	2.70
Oct. 28..... <i>a</i>	F. R. Steinberger..... <i>a</i>	.....	.....	.....	0.27	0.91
Dec. 8..... <i>a</i>	do..... <i>a</i>	.....	.....	.....	0.31	1.12
Dec. 30..... <i>a</i>	do..... <i>a</i>	.....	.....	.....	0.30	1.06

a Weir measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Long Creek near Estevan, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....			4.71		2.14	41.0	1.37	13.4
2.....			4.56		2.07	38.0	1.37	13.4
3.....			4.82		2.01	35.0	1.24	10.0
4.....			6.02		2.12	40.0	1.98	34.0
5.....			6.89		2.13	40.0	7.13	244.0
6.....			6.34		2.38	50.0	7.53	260.0
7.....			5.69		2.55	57.0	6.18	202.0
8.....			5.44		2.91	71.0	5.18	162.0
9.....			5.42		2.70	63.0	4.88	150.0
10.....			6.44		2.41	51.0	4.08	118.0
11.....			6.32		2.29	47.0	3.64	101.0
12.....			5.46		2.19	43.0	3.48	94.0
13.....			4.89		2.14	41.0	3.33	88.0
14.....	2.04	<i>b</i>	1.55		2.01	35.0	2.74	65.0
15.....	2.63		3.95	<i>b</i>	1.91	31.0	2.34	49.0
16.....	6.04		3.65	101	1.80	27.0	2.23	44.0
17.....	<i>a</i>		3.51	95	1.73	25.0	2.04	37.0
18.....			3.03	76	1.71	24.0	1.94	33.0
19.....			3.02	76	1.64	22.0	1.77	26.0
20.....			3.03	76	1.64	22.0	1.69	23.0
21.....			2.79	67	1.60	20.0	1.64	22.0
22.....	<i>a</i>		2.63	60	1.57	19.4	1.53	18.2
23.....	5.91		2.43	52	1.53	18.2	1.54	18.5
24.....	5.24		2.35	49	1.52	17.8	1.54	18.5
25.....	5.19		2.31	47	1.53	18.2	1.54	18.5
26.....	3.71		2.23	44	1.48	16.6	1.66	22.0
27.....	2.86		2.15	41	1.47	16.3	1.76	26.0
28.....	3.56		2.13	40	1.43	15.1	1.77	26.0
29.....	6.19		2.23	44	1.38	13.7	1.79	27.0
30.....	5.72		2.30	47	1.38	13.7	1.74	25.0
31.....	4.99				1.27	10.8		

a to *a* Water over gauge.*b* Ice conditions to April 16, and not sufficient data to compute the discharge.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Long Creek near Estevan, for 1914.

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1.66	22.00	0.76	1.86	1.33	5 0	1.68	2.80	0.30c	1.06	0.33	1.22
2.....	1.64	22.00	0.76	1.86	1.38	5 5	1.68	2.50	0.26	0.86	0.32	1.17
3.....	1.62	21.00	0.76	1.86	1.43	6 0	1.73	2.90	0.26	0.86	0.32	1.17
4.....	1.58	20.00	0.74	1.64	1.43	5 8	1.78	3.40	0.26	0.86	0.31	1.12
5.....	1.54	18.50	0.73	1.53	1.43	5 6	1.78	3.20	0.25	0.81	0.30	1.06
6.....	1.48	16.60	0.71	1.31	1.48	6 3	1.78	3.00	0.25	0.81	0.30	1.06
7.....	1.44	15.40	0.69	1.12	1.48	5 8	1.78	2.80	0.25	0.81	0.32	1.17
8.....	1.39	13.90	0.68	1.04	1.58	7 4	1.78	2.60	0.23	0.72	0.32	1.17
9.....	1.34	12.60	0.68	1.04	1.53	6 2	1 83	3.00	0.25	0.81	0.33	1.22
10.....	1.44	15.40	0.67	0.96	1.53	6 0	1 88	3.50	0.30	1.06	0.31	1.12
11.....	1.49	16.90	0.66	0.88	1.53	5 7	1.88	3.30	0.29	1.00	0.29	1.00
12.....	1.64	22.00	0.64	0.72	1.53	5 3	1.88	3.00	0.29	1.00	0.27	0.91
13.....	1.54	18.50	0.63	0.64	1.53	4 8	1.88	2.70	0.31	1.12	0.27	0.91
14.....	1.44	15.40	0.63	0.64	1.53	4 6	1.85	2.20	0.35	1.33	0.24	0.76
15.....	1.36	13.10	0.63	0.64	1.53	4 4	1.88	2.40	0.32	1.17	0.26	0.86
16.....	1.30	11.50	0.62	0.56	1.53	4 2	1.93	2.70	0.30	1.06	0.26	0 86
17.....	1.24	10.00	0.62	0.56	1.48	3 3	1.93	2.50	0.29	1.00	0.24	0.76
18.....	1.19	8.80	0.61	0.48	1.43	2 3	1.93	2.40	0.29	1.00	0.23	0.72
19.....	1.14	7.80	0.61	0.48	1.48	2 7	1.93	2.20	0.25	0.81	0.23	0.72
20.....	1.08	6.60	0.65	0.80	1.53	3 3	1.88	1.60	0.26	0.86	0.22	0.67
21.....	1.02	5.50	0.61	0.48	1 58	3 9	1.88	1.40	0.30	1.06	0.22	0.67
22.....	0.99	5.00	0.67	0.96	1.58	3 6	1.88	1.20	0.33	1.22	0.21	0.63
23.....	0.96	4.50	0.71	1.31	1.58	5 4	1.88	0.80	0.34	1.27	0.20	0.58
24.....	0.94	4.20	0.74	1.64	1.58	3 2	2.08	2.70	0.31	1.12	0.21	0.63
25.....	0.88	3.30	0.83	2.70	1.68	4 4	1.93	1.00	0.30	1.06	0.21	0.63
26.....	0.86	3.10	0.83	2.70	1.68	4 1	1.93	0.92	0.34	1.27	0.21	0.63
27.....	0.84	2.80	0.83	2.70	1.68	3 9	1.93	0.75	0.35	1.33	0.26	0.86
28.....	0.81	2.40	1.03	3.50	1.73	4 2	1.98	0.91	0.35	1.33	0.29	1.00
29.....	0.79	2.20	1.13	2.70	1.73	4 0	0.27	0.91	0.35	1.33	0.29	1.00
30.....	0.78	2.10	1.18	3.20	1.73	3 7	0.33	1.22	0.34	1.27	0.29	1.00
31.....	0.76	1.86	1.28	4 50	.....	.....	0 33	1.22	.....	0.30	.....	1.06

NOTE.—Weir measurements after Oct. 29; gauge reading gives the head on 2-foot weir.
c Interpolated.

MONTHLY DISCHARGE of Long Creek near Estevan, for 1914.

(Drainage area 1,380 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	101.00	40 00	61.00	0.0442	0.0250	1,815
May.....	71.00	10 80	32.00	0.0232	0.0300	1,968
June.....	260.00	10 00	66.00	0.4800	0.0500	3,927
July.....	22.00	1 86	11.10	0.0080	0.0090	682
August.....	4 50	0 48	1 52	0.0011	0.0010	93
September.....	7.40	2 30	4.70	0.0034	0.0040	280
October.....	3.50	0 75	2.20	0.0016	0.0020	135
November.....	1.33	0 72	1.04	0.0008	0.0009	62
December.....	1.22	0 58	0 91	0.0007	0.0008	56
The period.....	.....	.....	.....	.....	0 1227	9,018

SOURIS RIVER NEAR ESTEVAN.

Location.—On NE. $\frac{1}{4}$ Sec. 11, Tp. 2, Rge. 8, W. 2nd Mer., near the pumping plant of the Canadian Pacific Railway.

Records available.—June 23, 1911, to December 31, 1914.

Gauge.—Staff; elevation of zero was maintained at 82.45 feet during 1911-12; and at 82.55 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge about one mile upstream, or by wading at gauge.

Winter flow.—Affected by ice.

Observer.—W. Bevan.

DISCHARGE MEASUREMENTS of Souris River near Estevan, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		Feet.	Sq. ft.	Ft. per sec.	Feet.	Sec.-ft.
Jan. 2	F. R. Steinberger	2.6	0.52	0.15	0.87	0.08
Jan. 21	do	2.5	0.87	0.47	1.12	0.41
Feb. 10	do	3.4	0.98	0.58	0.96	0.57
Feb. 28	do	3.3	0.84	0.58	0.95	0.49
Mar. 23	do	71.0	133.00	1.37	11.23	182.00
May 12	W. H. Storey	45.0	312.00	0.20	2.72	61.00
June 17	do	50.0	296.00	0.20	2.25	58.00
July 11	do	14.5	9.80	1.98	1.40	19.40
July 28	do	9.0	3.50	0.81	0.81	2.80
Aug. 29	do	8.0	2.60	1.03	0.70	2.70
Oct. 27	F. R. Steinberger				0.21a	0.63
Dec. 9	do				0.28a	0.96
Dec. 30	do				0.27a	0.91

a Weir rod.

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Estevan, for 1914.

DAY.	January.		February.		March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1	0.74	0.10a	1.03	0.34	0.95	0.49	5.50	170	3.60	132	1.86	34
2	0.73	0.10	1.03	0.35	0.99	0.50	7.00	190	3.60	132	1.86	34
3	0.85	0.08	1.07	0.37	0.99	0.50	8.50	210	3.20	103	2.24	50
4	0.89	0.07	1.07	0.42	1.01	0.50	10.00	230	2.90	83	3.70	140
5	0.89	0.10	1.05	0.45	1.41	0.50	11.00	250	2.95	86	6.00	343
6	0.91	0.12	1.03	0.47	1.56	1.56	10.50	270	2.90	83	8.55	372
7	0.95	0.14	1.01	0.52	1.61	2.00	10.00	290	2.85	80	9.00	613
8	0.95	0.18	1.01	0.55	1.66	3.00	9.00	310	2.60	66	9.00	613
9	0.95	0.18	0.99	0.56	2.11	5.00	10.00	400	2.40	56	8.50	568
10	0.95	0.20	0.96	0.57	2.16	8.00	10.00	420	2.50	61	6.00	343
11	0.95	0.22	0.96	0.57	2.61	10.00	9.50	440	2.55	63	5.24	275
12	1.01	0.26	0.96	0.57	2.91	20.00	9.50	480	2.72	72	3.65	136
13	1.01	0.28	0.98	0.57	3.11	30.00	8.00	500	2.67	70	3.65	136
14	1.01	0.32	0.98	0.56	4.67	40.00	7.70	450a	2.65	68	3.20	103
15	1.01	0.36	0.98	0.56	5.51	50.00	6.00	343	2.65	68	3.00	89
16	1.01	0.38	0.96	0.55	6.11	60.00	5.50	298	2.65	68	3.00	89
17	1.00	0.41	0.98	0.54	7.00	80.00	4.20	181	2.60	66	2.25	50
18	1.00	0.42	0.98	0.53	9.00	100.00	4.20	181	2.42	57	2.20	48
19	1.00	0.42	0.99	0.52	11.00	150.00	4.20	181	2.40	56	2.10	44
20	1.00	0.42	0.99	0.51	11.50	160.00	4.00	164	2.38	55	2.00	40
21	0.99	0.42	0.99	0.50	11.00	160.00	3.40	117	2.38	55	2.00	40
22	0.99	0.42	0.99	0.49	11.50	170.00	3.20	103	2.30	52	1.96	38
23	1.00	0.42	0.98	0.48	11.00	180.00	2.80	77	2.25	50	1.96	38
24	1.00	0.42	0.97	0.47	11.00	200.00	2.80	77	2.23	49	1.90	36
25	1.01	0.40	0.97	0.47	10.00	200.00	2.90	83	2.23	49	1.90	36
26	1.01	0.35	0.96	0.47	9.50	200.00	2.90	83	2.10	44	1.87	35
27	1.01	0.37	0.97	0.48	7.50	180.00	3.00	89	2.10	40	1.87	35
28	1.03	0.40	0.95	0.49	7.00	170.00	3.25	107	1.96	38	1.70	29
29	1.03	0.43			7.00	170.00	3.00	89	1.96	38	1.70	29
30	1.02	0.42			6.50	150.00	3.00	89	1.90	36	1.68	28
31	1.02	0.36			6.00	150.00			1.90	36		

a Ice conditions Jan. 1 to April 14.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Estevan, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.		November.		December.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	1.86	34.0	0.78	3.60	0.65	1.50	0.64	1.40	0.21	0.63	0.30	1.05
2.....	1.70	29.0	0.76	3.20	0.65	1.50	0.64	1.40	0.21	0.63	0.30	1.05
3.....	1.67	28.0	0.76	3.20	0.65	1.50	0.65	1.50	0.21	0.63	0.30	1.05
4.....	1.66	28.0	0.75	3.00	0.64	1.40	0.65	1.50	0.20	0.59	0.31	1.10
5.....	1.66	28.0	0.75	3.00	0.60	1.00	0.66	1.60	0.19	0.53	0.30	1.05
6.....	1.64	27.0	0.72	2.40	0.60	1.00	0.66	1.60	0.19	0.53	0.29	1.00
7.....	1.62	27.0	0.70	2.00	0.57	0.85	0.66	1.60	0.19	0.53	0.30	1.05
8.....	1.58	25.0	0.70	2.00	0.57	0.85	0.68	1.80	0.20	0.59	0.28	0.96
9.....	1.58	25.0	0.70	2.00	0.54	0.70	0.68	1.80	0.20	0.59	0.28	0.96
10.....	1.50	23.0	0.70	2.00	0.54	0.70	0.69	1.90	0.20	0.59	0.28	0.96
11.....	1.50	23.0	0.68	1.80	0.52	0.60	0.70	2.00	0.21	0.63	0.28	0.96
12.....	1.48	22.0	0.68	1.80	0.52	0.60	0.70	2.00	0.21	0.63	0.28	0.96
13.....	1.20	14.0	0.68	1.80	0.50	0.50	0.70	2.00	0.21	0.63	0.28	0.96
14.....	1.14	12.2	0.67	1.70	0.50	0.50	0.68	1.80	0.21	0.63	0.28	0.96
15.....	1.10	11.0	0.67	1.70	0.50	0.50	0.68	1.80	0.21	0.63	0.28	0.96
16.....	1.05	9.5	0.67	1.70	0.50	0.50	0.65	1.50 <i>d</i>	0.21	0.63	0.28	0.96
17.....	1.00	8.0	0.65	1.50	0.49	0.48	0.72	1.43	0.21	0.63	0.28	0.96
18.....	0.97	7.4	0.65	1.50	0.49	0.48	0.74	1.36	0.21	0.63	0.28	0.96
19.....	0.97	7.4	0.60	1.00	0.48	0.46	0.70	1.29	0.22	0.67	0.28	0.96
20.....	0.94	6.8	0.58	0.90	0.50	0.50	0.72	1.22	0.25	0.81	0.28	0.96
21.....	0.94	6.8	0.58	0.90	0.50	0.50	0.76	1.15	0.25	0.81	0.28	0.96
22.....	0.90	6.0	0.56	0.80	0.54	0.70	0.76	1.08	0.27	0.90	0.28	0.96
23.....	0.86	5.2	0.56	0.80	0.58	0.90	0.76	1.01	0.27	0.90	0.28	0.96
24.....	0.85	5.0	0.56	5.20	0.58	0.90	0.76	0.94	0.30	1.05	0.28	0.96
25.....	0.80	4.0	0.56	5.20	0.58	0.90	0.78	0.87	0.30	1.05	0.28	0.96
26.....	0.80	4.0	0.86	5.20	0.59	0.95	0.78	0.80 <i>d</i>	0.30	1.05	0.28	0.96
27.....	0.80	4.0	0.70	2.00	0.59	0.95	0.78 <i>a</i>	0.71	0.31	1.10	0.28	0.96
28.....	0.78	3.6	0.70	2.00	0.60	1.00	0.21 <i>b</i>	0.63	0.32	1.15	0.27	0.90
29.....	0.78	3.6	0.69	1.90	0.60	1.00	0.21	0.63	0.33	1.20	0.27	0.90
30.....	0.80	4.0	0.69	1.90	0.61	1.10	0.20	0.59	0.33	1.20	0.27	0.90
31.....	0.82	4.4	0.67	1.70	.....	.....	0.20	0.59	.....	.....	0.27 <i>c</i>	0.90

a 0.78 on summer gauge rod—0.21 on weir rod.*b* to *c* Weir measurements.*d* to *d* Ice conditions.

MONTHLY DISCHARGE of Souris River near Estevan, for 1914.

(Drainage area 4,550 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
January.....	0.43	0.07	0.30	0.00007	0.00008	18
February.....	0.57	0.34	0.50	0.00011	0.00011	28
March.....	200.00	0.49	86.00	0.01900	0.02000	5,288
April.....	500.00	77.00	229.00	0.05000	0.06000	13,626
May.....	132.00	36.00	65.00	0.01400	0.02000	3,997
June.....	613.00	28.00	155.00	0.03400	0.04000	9,223
July.....	34.00	3.60	14.40	0.00320	0.00400	885
August.....	5.20	0.80	2.20	0.00050	0.00060	135
September.....	1.50	0.46	0.83	0.00018	0.00020	49
October.....	2.00	0.59	1.35	0.00030	0.00030	83
November.....	1.20	0.53	0.76	0.00017	0.00020	45
December.....	1.10	0.90	1.00	0.00022	0.00030	61
The year.....	.....	.....	.....	.....	0.14579	33,438

MOOSE MOUNTAIN CREEK NEAR OXBOW.

Location.—On NE. $\frac{1}{4}$ Sec. 15, Tp. 3, Rge. 2, W. 2nd Mer., one mile south and one-half mile west of the Canadian Pacific Railway station at Oxbow.

Records available.—From September 4, 1913, to October 31, 1914.

Gauge.—Vertical staff; elevation of zero was 91.94 feet during 1913-14.

Bench-mark.—On stump of tree 50 feet upstream from gauge, painted white; assumed elevation 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge one-quarter mile upstream, or by wading.

Winter flow.—No winter observations have been taken.

Observer.—W. E. Christmas.

DISCHARGE MEASUREMENTS of Moose Mountain Creek near Oxbow, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 13	W. H. Storey	37	63.0	1.82	2.86	116.0
June 20	do	28	26.0	1.71	2.02	45.0
July 14	do	26	19.0	1.76	1.65	33.0
July 30	G. H. Whyte and W. H. Storey	13	4.9	0.87	0.91	4.2
Sept. 1	W. H. Storey	13	4.9	0.75	0.97	4.2

DAILY GAUGE HEIGHT AND DISCHARGE of Moose Mountain Creek near Oxbow, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1			4.92	140 ^b	2.97	126	1.93	43
2			6.07	150	3.00	129	1.91	42
3			6.70	160	3.01	130	1.81	35
4			5.30	180	3.05	134	2.10	55
5	3.43	a	5.05	190	3.03	132	2.18	61
6	4.22		4.55	200	3.23	150	2.38	77
7	4.17		4.48	210	3.21	148	2.87	147
8	3.90		4.54	230	3.26	152	3.43	168
9	3.24		5.10	300	3.33	159	3.52	176
10	3.24		6.20	340	3.20	147	3.33	159
11	3.31		6.10	350	3.11	139	3.02	131
12	2.55		5.56	350 ^b	3.06	134	2.83	114
13	3.86		5.84	385 ^c	2.85	116	2.50	87
14	5.13		5.58	361	2.78	109	2.54	90
15	6.60		5.16	323	2.72	105	2.35	75
16	5.74		4.79	290	2.67	101	2.22	65
17	6.63		4.59	272	2.63	97	2.12	57
18	6.69		4.32	248	2.64	98	2.06	52
19	5.86		4.16	253	2.55	91	2.07	53
20	5.10		4.08	226	2.68	101	2.02	49
21	4.75		3.91	211	2.62	97	1.99	47
22	5.37		3.66	188	2.53	89	1.95	44
23	5.30		3.59	182	2.48	85	1.90	41
24	4.68		3.49	173	2.41	80	1.87	39
25	4.88		3.35	161	2.38	77	1.90	41
26	4.60		3.18	145	2.34	74	1.88	39
27	4.81		3.12	140	2.27	69	1.88	39
28	4.56		3.00	129	2.13	58	1.79	34
29	4.44		2.99	128	2.17	61	1.95	44
30	4.37		2.93	123	2.13	58	1.78	33
31	4.79	a			2.05	52		

a March 5 to 31—not estimated; insufficient data.

b April 1 to 12—discharge estimated.

c April 13—creek clear of ice.

SESSIONAL PAPER No. 25c

DAILY GAUGE HEIGHT AND DISCHARGE of Moose Mountain Creek near Oxbow, for 1914.
—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.	Feet.	Sec.-ft.
1.....	1 74	31.0	0 83	3 10	0 96	4 7	0 76	2 50
2.....	1 68	27.0	0 85	3 40	0 94	4 4	0 74	2 30
3.....	1 62	25.0	0 86	3 50	0 93	4 3	0 74	2 30
4.....	1 60	24.0	0 78	2 60	0 94	4 4	0 74	2 30
5.....	1 57	22.0	0 74	2 30	1 02	5 6	0 74	2 30
6.....	1 59	23.0	0 70	2 00	1 00	5 2	0 74	2 30
7.....	1 60	24.0	0 69	1 94	1 01	5 4	0 74	2 30
8.....	1 57	22.0	0 67	1 82	1 00	5 2	0 74	2 30
9.....	1 58	22.0	0 64	1 64	0 98	4 9	0 64	1 64
10.....	1 62	25.0	0 63	1 58	0 96	4 7	0 64	1 64
11.....	1 65	26.0	0 61	1 46	0 94	4 4	0 49	0 86
12.....	1 95	44.0	0 59	1 35	0 94	4 4	0 48	0 82
13.....	1 83	36.0	0 57	1 25	0 94	4 4	0 48	0 82
14.....	1 68	28.0	0 56	1 20	0 93	4 3	0 48	0 82
15.....	1 65	26.0	0 48	0 82	0 92	4 2	0 48	0 82
16.....	1 53	21.0	0 47	0 78	0 90 ^a	3 9	0 47	0 78
17.....	1 47	18.0	0 50	0 90	0 89	3 8	0 47	0 78
18.....	1 45	17.2	0 52	1 00	0 87	3 6	0 47	0 78
19.....	1 40	15.2	0 51	0 95	0 86	3 5	0 47	0 78
20.....	1 35	13.6	0 51	0 95	0 84	3 2	0 47	0 78
21.....	1 35	13.6	0 51	0 95	0 86	3 5	0 45	0 70
22.....	1 34	13.3	0 55	1 15	0 84	3 2	0 46	0 74
23.....	1 31	12.3	1 08	6 60	0 83	3 1	0 46	0 74
24.....	1 29	11.7	0 79	2 70	0 82	3 0	0 46	0 74
25.....	1 25	10.6	0 96	4 70	0 82	3 0	0 46	0 74
26.....	1 22	9.8	1 03	5 70	0 79	2 7	0 46	0 74
27.....	1 20	9.2	1 00	5 20	0 78	2 6	0 46	0 74
28.....	1 08	6.6	0 99	5 10	0 77	2 6	0 45	0 70
29.....	1 06	6.3	1 04	5 90	0 78	2 6	0 46 ^a	0 74
30.....	0 91	4.1	1 02	5 60	0 76	2 5	0 45	0 70
31.....	0 86	3.5	0 98	4 90	.....	.....	0 74	2 32

^a Interpolated.

MONTHLY DISCHARGE of Moose Mountain Creek near Oxbow, for 1914.

(Drainage area 2,953 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	385.0	123.00	224.0	0 0760	0 0848	13,329
May.....	159.0	52.00	106.0	0 0360	0 0415	6,518
June.....	176.0	33.00	71.0	0 0240	0 0268	4,225
July.....	44.0	3.50	19.0	0 0060	0 0069	1,168
August.....	6.6	0 78	2.7	0 0010	0 0012	166
September.....	5.6	2.50	3.9	0 0013	0 0014	232
October.....	2.5	0 74	1.3	0 0004	0 0005	80
The period.....	.....	.....	.....	.....	0.1631	25,718

SOURIS RIVER NEAR GLEN EWEN.

Location.—On NE. $\frac{1}{4}$ Sec. 36, Tp. 2, Rge. 1, W. 2nd Mer., two miles south and one mile east of Canadian Pacific Railway station at Glen Ewen.

Records available.—June 26, 1911, to October 31, 1914.

Gauge.—Staff; zero of gauge was maintained at 79.32 feet during 1911, and at 78.98 feet during 1912-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge, which is about one mile above the gauge, or by wading at or near the gauge.

Winter flow.—No winter observations have been taken.

Observer.—D. F. Preston.

DISCHARGE MEASUREMENTS of Souris River near Glen Ewen, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i> Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
Mar. 26.....	F. R. Steinberger.....	.....	180	1.26	9.65	227.00 ^a
May 14.....	W. H. Storey.....	56	204	1.06	4.02	216.00
June 17.....	do.....	55	160	0.85	3.22	136.00
July 13.....	do.....	50	62	1.11	2.69	69.00
July 29.....	G. H. Whyte and W. H. Storey.....	45	42	0.48	2.04	20.20
Aug. 31.....	W. H. Storey.....	33	24	0.32	1.70	7.70
Oct. 29.....	F. R. Steinberger.....	46	13	0.21	2.00	2.80

^a Float measurement.

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Glen Ewen, for 1914.

DAY.	March.		April.		May.		June.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	.....	.....	7.30	.....	3.91	203	2.79	80
2.....	.....	.....	7.95	.....	3.85	197	2.75	76
3.....	.....	.....	10.00	.....	3.85	197	2.75	76
4.....	.....	.....	9.15	.....	3.80	191	2.79	80
5.....	.....	.....	9.10	.....	3.98	211	2.91	92
6.....	.....	.....	9.00	.....	4.30	246	2.98	100
7.....	.....	.....	9.08	.....	4.35	251	3.50	157
8.....	.....	.....	9.85	.....	4.28	244	5.20	345
9.....	.....	.....	10.12	.....	4.60	279	6.45	483
10.....	.....	.....	10.87	.....	4.70	290	6.60	499
11.....	.....	.....	11.25	.....	4.61	280	5.60	389
12.....	.....	.....	12.20	.....	4.45	262	5.34	360
13.....	.....	.....	10.35	.....	4.23	238	4.75	295
14.....	.....	.....	10.75	.....	4.00	213	4.24	239
15.....	7.10	^a	10.49	^a	3.88	200	3.93	205
16.....	9.65	.....	8.57	716	3.78	188	3.81	192
17.....	9.53	.....	7.80	631	3.73	182	3.59	167
18.....	10.30	.....	6.95	538	3.68	177	3.30	135
19.....	10.15	.....	6.46	484	3.61	169	3.24	128
20.....	10.07	.....	6.20	455	3.58	166	3.19	123
21.....	8.45	.....	5.69	399	3.50	157	3.06	109
22.....	8.65	.....	5.30	356	3.43	149	3.03	105
23.....	9.75	.....	4.88	310	3.37	143	2.90	91
24.....	10.05	.....	4.69	289	3.30	135	2.81	82
25.....	10.00	.....	4.53	271	3.25	129	2.80	81
26.....	10.30	.....	4.30	246	3.05	107	2.81	82
27.....	9.80	.....	4.19	234	3.09	112	2.80	81
28.....	9.95	.....	4.13	227	2.98	100	2.78	79
29.....	9.02	.....	4.05	218	2.90	91	2.77	78
30.....	7.95	.....	4.10	224	2.90	91	2.79	80
31.....	7.15	.....	.....	.....	2.82	83	.....	.....

^a March 15 to April 15, ice conditions; insufficient data to estimate discharge.

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DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Glen Ewen, for 1914.—*Concluded.*

DAY.	July.		August.		September.		October.	
	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.	Gauge Height.	Discharge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....	2.79	80.0	1.85	12.5	1.72	7.7	1.88	13.7
2.....	2.74	75.0	1.85	12.5	1.71	7.4	1.88	13.7
3.....	2.70	71.0	1.85	12.5	1.71	7.4	1.88	13.7
4.....	2.64	65.0	1.84	12.1	1.70	7.0	1.88	13.7
5.....	2.62	63.0	1.85	12.5	1.68	6.6	1.89	14.1
6.....	2.63	64.0	1.83	11.7	1.71	7.4	1.88	13.7
7.....	2.59	60.0	1.81	10.9	1.75	8.7	1.85	12.5
8.....	2.59	60.0	1.80	10.5	1.80	10.5	1.85	12.5
9.....	2.58	59.0	1.78	9.8	1.80	10.5	1.84	12.1
10.....	2.56	57.0	1.77	9.4	1.79	10.1	1.84	12.1
11.....	2.59	60.0	1.75	8.7	1.80	10.5	1.85	12.5
12.....	2.61	62.0	1.74	8.4	1.79	10.1	1.90	14.5
13.....	2.69	70.0	1.71	7.4	1.76	9.1	1.90	14.5
14.....	2.62	63.0	1.69	6.8	1.77	9.4	1.91	14.9
15.....	2.59	60.0	1.67	6.4	1.78	9.8	1.86	12.9
16.....	2.54	56.0	1.66	6.2	1.81	10.9	1.87	13.3
17.....	2.49	51.0	1.67	6.4	1.76	9.1	1.87	13.3
18.....	2.44	47.0	1.68	6.6	1.77	9.4	1.86	12.9
19.....	2.41	45.0	1.68	6.6	1.80	10.5	1.90	14.5
20.....	2.34	40.0	1.67	6.4	1.82	11.3	1.91	14.9
21.....	2.29	36.0	1.67	6.4	1.85	12.5	1.92	15.4
22.....	2.19	29.0	1.78	9.8	1.90	14.5	1.93	15.8
23.....	2.19	29.0	1.85	12.5	1.88	13.7	1.92	15.4
24.....	2.19	29.0	1.86	12.9	1.88	13.7	1.95	16.7
25.....	2.18	29.0	1.81	10.9	1.88	13.7	1.96	17.2
26.....	2.14	26.0	1.78	9.8	1.89	14.1	1.98	18.1
27.....	2.11	25.0	1.74	8.4	1.90	14.5	1.98	18.1
28.....	2.17	28.0	1.71	7.4	1.90	14.5	1.99	18.5
29.....	1.96	17.2	1.78	9.8	1.90	14.5	1.99	18.5
30.....	1.86	12.9	1.78	9.8	1.90	14.5	2.14	26.0
31.....	1.85	12.5	1.72	7.7	.....	.....	2.10	24.0

MONTHLY DISCHARGE of Souris River near Glen Ewen, for 1914.

(Drainage area 7,500 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet.
April.....	716.0	218.0	373.0	0.0500	0.028	11,097
May.....	290.0	83.0	183.0	0.0244	0.028	11,252
June.....	499.0	76.0	170.0	0.0230	0.026	10,116
July.....	80.0	12.5	48.0	0.0064	0.007	2,951
August.....	12.9	6.2	9.4	0.0012	0.001	578
September.....	14.5	6.6	10.8	0.0014	0.002	643
October.....	26.0	12.1	15.3	0.0020	0.002	940
The period.....	.....	.....	.....	.....	0.094	37,577

SOURIS RIVER NEAR MELITA.

Location.—On SW. $\frac{1}{4}$ Sec. 6, Tp. 4, Rge. 26, W. Pr. Mer., on traffic bridge in park, close to town of Melita, Man.

Records available.—July 20, 1911, to October 31, 1914.

Gauge.—Staff; zero of gauge was maintained at 84.02 feet during 1911; 84.13 feet during 1912; 84.45 feet during 1913-14.

Bench-mark.—Permanent iron bench-mark; assumed elevation, 100.00 feet.

Channel.—Permanent.

Discharge measurements.—From bridge or by wading.

Winter flow.—No winter observations have been taken.

Observer.—Walter Kay.

DISCHARGE MEASUREMENTS of Souris River near Melita, in 1914.

Date.	Engineer.	Width.	Area of Section.	Mean Velocity.	Gauge Height.	Discharge.
		<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
May 15.....	W. H. Storey.....	98	431.0	1.180	4.99	509
June 20.....	do.....	86	220.0	0.696	2.58	153
July 14.....	do.....	86	222.0	0.690	2.56	154
July 30.....	do.....	87	225.0	0.660	2.52	148
Sept. 1.....	do.....	80	145.0	0.500	1.70	72
Oct. 30.....	F. R. Steinberger.....	58	66.2	0.340	1.05	23

DAILY GAUGE HEIGHT AND DISCHARGE of Souris River near Melita, for 1914.

DAY.	June.		July.		August.		September.		October.	
	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.	Gauge Height.	Dis-charge.
	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>
1.....			2.70	169	2.40	137	1.70	72	1.02	21.0
2.....			2.68	167	2.35	132	1.68	70	1.00	20.0
3.....			2.64	162	2.34	131	1.67	69	0.99	19.5
4.....			2.60	158	2.34	131	1.65	68	0.98	19.0
5.....			2.60	158	2.32	129	1.62	65	0.98	19.0
6.....			2.67	166	2.30	127	1.58	61	0.97	18.5
7.....			2.58	156	2.29	126	1.55	59	0.97	18.5
8.....			2.59	157	2.27	124	1.50	55	0.96	18.0
9.....			2.58	156	2.24	121	1.40	48	0.95	17.5
10.....			2.57	155	2.22	119	1.38	47	1.00	20.0
11.....			2.57	155	2.21	118	1.36	45	1.16	31.0
12.....			2.56	154	2.20	117	1.35	44	1.16	31.0
13.....			2.55	152	2.19	116	1.35	44	1.15	30.0
14.....			2.56	154	2.16	113	1.37	46	1.08	26.0
15.....			2.55	152	2.12	110	1.36	45	1.00	20.0
16.....			2.54	151	2.10	108	1.33	43	0.96	18.0
17.....			2.53	150	2.09	107	1.30	41	0.94	17.0
18.....			2.52	149	2.06	104	1.28	40	0.92	16.0
19.....			2.52	149	2.03	102	1.25	37	0.93	16.5
20.....	2.58	156	2.45	142	2.00	99	1.22	35	0.90	15.0
21.....	2.50 ^b	147	2.48	145	1.99	98	1.15	31	0.92	16.0
22.....	2.45	142	2.47	144	1.98	97	1.08	26	0.91	15.5
23.....	2.49	146	2.46	143	2.00	99	1.08	26	0.92	16.0
24.....	2.47	144	2.45	142	2.10	108	1.07	25	0.93	16.5
25.....	2.55	152	2.44	141	2.08	106	1.05	23	0.90	15.0
26.....	2.52	149	2.42	139	2.10	108	1.02	21	0.92	16.0
27.....	2.50	147	2.40	137	2.06	104	1.01	21	0.94	17.0
28.....	2.59	157	2.38	135	2.00	99	1.00	20	0.93	16.5
29.....	2.75	175	2.50	147	1.95	94	1.02	21	0.95	17.5
30.....	2.74	174	2.49	146	1.90	90	1.03	22	1.05	24.0
31.....			2.42	139	1.80	81			1.09	26.0

^a No observations previous to June 20; no observer obtainable.

^b Interpolated.

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MONTHLY DISCHARGE of Souris River near Melita, for 1914.

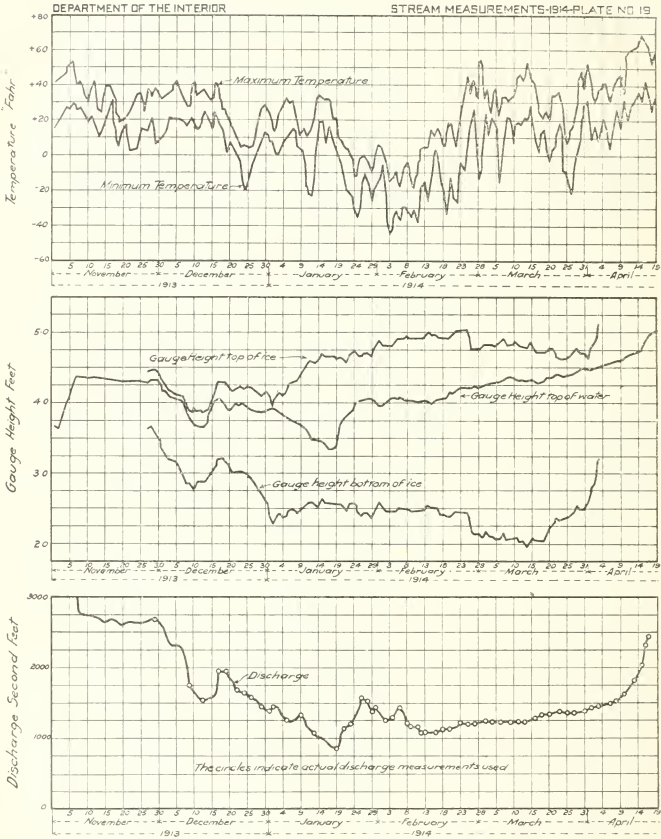
(Drainage area 10,673 square miles.)

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF	
	Maximum.	Minimum	Mean.	Per square Mile.	Depth in inches on Drainage Area.	Total in Acre-feet
June.....	175	142	153.0	0.0140	0.0057	3,338
July.....	169	135	151.0	0.0141	0.0163	9,285
August.....	137	81	111.0	0.0104	0.0120	6,825
September.....	72	20	42.0	0.0040	0.0015	2,499
October.....	31	15	19.6	0.0019	0.0022	1,205
The period.....					0.0407	23,452

MISCELLANEOUS DISCHARGE MEASUREMENTS made in Souris River drainage basin, in 1914.

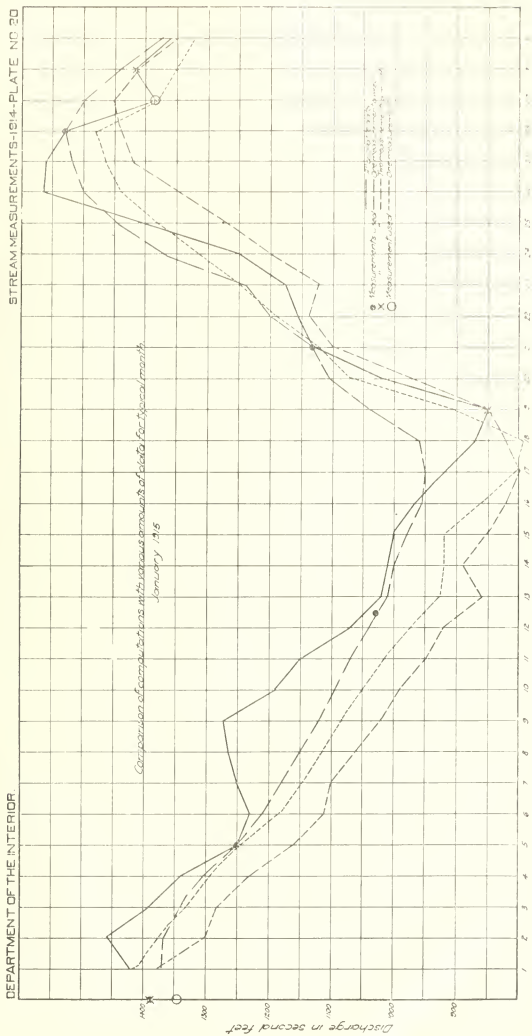
Date.	Engineer.	Stream.	Location.	Width.	Area of Section.	Mean Velocity.	Discharge.
				<i>Feet.</i>	<i>Sq. ft.</i>	<i>Ft. per sec.</i>	<i>Sec.-ft.</i>
Jan. 1....	F. R. Steinberger	Souris River.....	At Weyburn....	10.3	3.45	.....	<i>a</i>
Feb. 9....	do	do	do	.....	.....	<i>b</i>	Nil.
Mar. 21....	do	do	do	47.0	121.00	.....	1.00
May 11....	W. H. Storey	do	do	.....	.....	<i>b</i>	Nil.
June 17....	do	do	do	.....	.....	<i>b</i>	"
July 11....	do	do	do	.....	.....	<i>b</i>	"
July 27....	do	do	do	.....	.....	<i>b</i>	"
Aug. 29....	do	do	do	.....	.....	<i>b</i>	"
Oct. 26....	F. R. Steinberger	do	do	.....	.....	<i>b</i>	"
Dec. 30....	do	do	do	.....	.....	<i>b</i>	"

a Small discharge.*b* Water standing in pools.



OBSERVATIONS OF GAUGE HEIGHTS ON NORTH SASKATCHEWAN RIVER AT PRINCE ALBERT SASKATCHEWAN WITH CORRESPONDING MAXIMUM AND MINIMUM TEMPERATURES AND THE ESTIMATED DAILY DISCHARGES FOR THE WINTER 1913-1914.

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APPENDIX.

BRIEF REPORT AS TO NUMBER OF DISCHARGE MEASUREMENTS REQUIRED TO OBTAIN RECORDS OF THE DAILY DISCHARGE OF THE NORTH SASKATCHEWAN RIVER AT PRINCE ALBERT, SASK., DURING THE WINTER PERIOD.

By G. H. WHYTE.

The following is a brief discussion of the methods of computing stream flow under ice conditions from gauge heights, temperatures and a few discharge measurements as applied to the North Saskatchewan River at Prince Albert, Saskatchewan, during the winter of 1913-14.

At the urgent request of the Water Power Branch of the department and the city of Prince Albert, it was decided early in December, 1913, to place a resident hydrometric engineer at Prince Albert for the purpose of making discharge measurements of the North Saskatchewan River at that point every second or third day throughout the winter season. Mr. W. H. Storey was chosen for this work, and on December 8th and 9th made the first discharge measurement, which was followed by further measurements every two or three days until the stream was clear of ice in April. Including a gauging made by Mr. O. H. Hoover, on November 29th, a total of 55 discharge measurements were made during the period of ice cover, divided by months as follows: November, 1; December, 10; January, 11; February, 13; March, 13; and April, 7. The stream froze over on November 6th, and began to break up on April 16th, being clear of all ice on April 23rd.

The North Saskatchewan River at Prince Albert was on an average 600 feet wide and 3½ feet deep, with a mean velocity of some seven-tenths feet per second, with an ice cover of from 1 foot to 2½ feet during the winter. Discharge measurements were made with current meters of the Gurley Price Pattern No. 623, by suspending with rods through holes in the ice, and taking velocities at from 4 to 9 points in the vertical for periods from 40 to 70 seconds or more at each point. Two newly rated meters were used in this work, and one instrument was checked against the other throughout the year to eliminate all chance of error. Both instruments were re-rated in the spring and found to calibrate the same as at the beginning of the work. Every precaution was also taken while making the gaugings to ensure accuracy.

The gauging section was some 600 yards below the bridge at which open-water records are obtained. Most of the holes were about 20 feet apart, but some near the edge of the stream, where the water was shallow, were 5 to 10 feet apart. The average number of holes was about 35.

The velocities obtained in each vertical were plotted and a velocity curve drawn, and the mean velocity from this curve taken as the mean in the vertical. This work was done by Mr. Storey on days between gaugings, and the notes forwarded to the office, where they were carefully examined and checked. The areas were obtained in the usual manner, and included only the area of the cross-section under the ice.

Gauge heights were taken three times a day by Mr. Storey with the regular chain gauge at the bridge. This included top of ice, thickness of ice and water surface. The gauge was checked with a level once a week and kept at the proper datum. The thickness of ice was measured with our regular ice scale, and was taken at various points near the gauge so that a true thickness was obtained.

Temperatures were obtained from the Dominion Government meteorological stations at Edmonton, Battleford, and Prince Albert.

The records as published in this report and used in the comparisons were computed by Messrs. W. H. Storey and O. H. Hoover from all available data, and are assumed to be very nearly accurate. The method used was that fully described by Mr. W. G. Hoyt of the United States Geological Survey in Water Supply Paper No. 337, page 51, published by that Survey, and is known as the eye method. It was found that this method gave the best results under the conditions found at this station, and it may be briefly described as plotting graphs of the records of maximum and minimum temperatures, and the records of gauge heights of water surface and top and bottom of the ice. The discharges obtained by actual discharge measurements are plotted, and the discharge graph is completed by estimating the daily discharge for the periods between measurements by referring to the temperature and gauge height graphs. The engineer making this estimate should have a good idea as to the conditions of flow of the stream at the station during the winter period. Where the stream flow is regular and there are sufficient measurements, fairly accurate results may be obtained. Plate 19 shows the records as completed by this method and used in these results.

It was desired to determine to what degree of accuracy estimates by this method could be made by using actual measurements obtained at various periods of time. The full temperature and gauge height records were given to each engineer assigned to this work, but only a certain number of the discharge measurements. Mr. P. H. Daniells was given one measurement a week, I took two measurements a month (the first made and the one made nearest the middle of the month), and Mr. J. M. Paul was given one measurement a month.

Plate 20 shows the results obtained for the month of January, and is typical of the period estimates. The following tables give a comparison of the monthly means and period mean from the four estimates. It will be noted that only the months of December, January, February and March were used, as it was not considered advisable to use the periods when ice was forming or breaking up, as they are liable to errors in estimates under any method.

The results show that for a single day there are likely to be quite large errors, but for a month or winter the error in the mean is not of any size. At stations on the North Saskatchewan River or streams of a similar type, which are a considerable distance from the source of supply, it is seen that discharge measurements made once every two or three weeks will supply sufficient data, with daily temperature and gauge height records, to make estimates close enough for almost any use. However, nearer the source of supply of a stream it is often desired that more frequent discharge measurements be made, as such streams are not as likely to maintain a uniform flow.

COMPARISON OF DAILY AND MONTHLY MEAN DISCHARGE of the North Saskatchewan River at Prince Albert, Sask., obtained with various amounts of data.

METHOD.	Mean discharge in second-feet.	Difference from Method I in sec.-ft. and per cent.	Greatest difference from Method I for single day in sec.-ft. and per cent.
December 1913.			
I. All data available.....	1,819.00		
II. One measurement a week.....	1,753.00	- 66 or - 3.68%	- 370 or - 18%
III. Two measurements a month.....	1,953.00	+ 134 or + 7.37%	+ 383 or + 22%
IV. One measurement a month.....	1,436.00	- 383 or - 21.06%	- 800 or - 35%
January 1914.			
I. All available data.....	1,221.00		
II. One measurement a week.....	1,218.00	- 3 or - 0.25%	+ 190 or + 22%
III. Two measurements a month.....	1,117.00	- 104 or - 8.52%	- 252 or - 20%
IV. One measurement a month.....	1,166.00	- 55 or - 4.5%	- 187 or - 15%
February 1914.			
I. All available data.....	1,191.00		
II. One measurement a week.....	1,188.00	- 3 or - 0.25%	- 130 or - 10%
III. Two measurements a month.....	1,155.00	- 36 or - 3.02%	- 273 or - 19%
IV. One measurement a month.....	1,256.00	+ 65 or + 5.46%	+ 140 or + 12%
March 1911.			
I. All available data.....	1,295.00		
II. One measurement a week.....	1,302.00	+ 7 or + 0.54%	+ 30 or + 2%
III. Two measurements a week.....	1,297.00	+ 2 or + 0.15%	- 83 or - 6%
IV. One measurement a month.....	1,279.00	- 16 or - 1.24%	- 116 or - 9%
Period, December to March.			
I. All available data.....	1,381.50		
II. One measurement a week.....	1,365.25	- 16.25 or - 1.17%	
III. Two measurements a month.....	1,380.50	- 1.00 or - 0.072%	
IV. One measurement a month.....	1,284.25	- 97.25 or - 7.04%	

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